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UNIVERSITY OF TORONTO



REPORT OF THE DEAN  
OF THE  
FACULTY OF MEDICINE

*Session 1949-1950*

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## *Report of the Dean of the Faculty of Medicine*

The close of the University year, coming as it does at the end of June, is ill timed for most of us, in that we find it not easy to deal with facts and figures in the evenings of early summer, when all our friends are busy with gardens and plans for holidays. Nevertheless, as I read again the reports from seventeen departments and from the various student societies, I am aware of the stimulus of a leisurely digest and annual review of the activities in the many divisions of the Faculty of Medicine. We read on the one hand of involved fundamental research which may influence the lives and happiness of all mankind, or which may only add in a small measure to the sum total of human knowledge. On the other hand there are such widely diversified notes as the interest of the Department of Paediatrics in school meals for children, the interest of the Department of Psychiatry in industrial relations, the survey of certain types of blindness by the Department of Ophthalmology, and the work of the Department of Oto-Laryngology in rehabilitation of the deaf.

Our Convocation for the Faculty of Medicine was held this year on June 16. Dr. Earle Scarlett, a graduate of this school in the year 1924, who practises in Calgary, addressed Convocation. The school is fortunate that Dr. Scarlett agreed to journey east and bring to the graduating class the thought and wisdom of one who has held high the ideals of practice in western Canada for a quarter of a century. One hundred and fifty-nine received the degree of M.D. and 9 graduates the degree of B.Sc.(Med.). Again the weather was perfect, the sun shone, the Hart House bells rang happily and large crowds of parents, wives, and well-wishers filled the hall, and afterwards the Hart House quadrangle.

The year has again been a busy and stimulating one. Our registration continues in the neighbourhood of 1,000, including the two premedical years. The school now has the doubtful distinction of being the largest medical undergraduate training centre on the continent. We again took 150 in the first of the premedical years. Five years after the war there are few veterans seeking admission, but there are still large numbers in the upper years. The class graduating this year was largely made up of veterans. Certainly these men were, in the opinion of their teachers, further evidence of the justification of government ex-service policy. Matured by their experience, these students possess a firm resolve to prepare for professional life.

In the writings of American educators, one reads of the steadily rising costs of medical education in the United States. Fees, large as they are in relation to other faculties, can account for only a fraction of the annual cost per student in the overall budget. In certain American schools this figure is as high as \$3,500. The annual cost per student in our own school does not approach that figure, but even so the annual fee paid by the student covers only about 35 per cent of the budget. The average student in Toronto needs about \$1,200 to see him through each of the four professional years. Many are able to contribute a considerable amount by earning in the long vacation, but there still remains a varying deficit which must be met either from parents or friends, or from bursaries or loan funds. The University, recognizing this problem, has made available a bursary fund of considerable proportions. Likewise, the Dominion-provincial bursary fund gives valuable aid. The duties of the Faculty Loans and Bursaries Committee are increasingly heavy, as they must do the best they can with the funds available, to see that they are distributed to the most deserving students. With a steadily increasing proportion of students who are not in receipt of D.V.A. benefits, this task will be all the heavier in future years. It is obvious that if we are to get the best students, particularly from districts outside the Toronto area, consideration will have to be given to liberal maintenance bursaries. Otherwise it would seem impossible for the sons of artisans and farmers



in country areas to contemplate professional medical training. The student who lives within daily travelling distance of the University has a great financial advantage, in that bed and board are provided by his parents in his own home.

In undergraduate affairs, something new was added to the usual programme of social events by the institution of a general social gathering for all the faculty and other members of the University. It has been called "Panacea" and apparently justified fully the efforts of the Medical Society. A new publication called *Palinodia*, describing the life and activities of the Faculty, appeared this spring. It is largely a pictorial review and is extremely well done. It is hoped that it may be continued. The medical journal grows in volume, circulation, and the quality of the contributions. Large numbers of students have taken part in the interfaculty sports and some twenty odd have represented the University on its senior teams. The President of the Medical Society was selected as the President of the Students' Administrative Council. In spite of his varied duties he has attained first-class honour standing and has been selected as one of two Rhodes Scholars from the Province of Ontario.

On July 1, 1950, the Faculty of Medicine assumed responsibility for the administration and teaching in the courses of Physical Therapy and Occupational Therapy. This decision was reached following several meetings of the Faculty. It has been thought wise to reorganize completely the curriculum and present a new combined course. This will be offered for the first time in the autumn of 1950. Students previously enrolled in the diploma courses which have been administered by the Department of University Extension will complete their course according to the old curriculum. New students will be eligible for a diploma in Physical and Occupational Therapy in three years. A committee under the chairmanship of Dr. Botterell has laboured long and faithfully during the winter months and it is hoped that the graduates from the new course will find an increasingly important role and responsibility in the field of convalescent therapy and rehabilitation. Dr. Andrew Zinovieff has recently come to us from Oxford, England, where he was in charge of the physical medicine and rehabilitation unit there. He will have the responsibility for directing this pioneer effort.

Graduate work continues to be an important part of the work of the school. This will be immediately apparent when one reads the reports of the various departments. The programmes in the various clinical specialties which were strengthened and extended in the years immediately after the war are providing a steady supply of young specialists who go out to all parts of Canada. The federal health grants have been of particular value in the field of Psychiatry and Public Health. Psychiatry is hampered still by inadequate accommodation, both for in-patients and out-patients. Government aid, on an annual basis, liberal though it may be, carries with it a considerable degree of administrative frustration, and, like all grants of this nature, makes for difficulty and insecurity in long-term planning.

It is gratifying to record that the new Hospital for Sick Children will be ready for occupancy during the coming academic session. Large lecture rooms fitted with the most modern projection apparatus, new and spacious laboratories—all these will facilitate the work of teaching and research. The Western and St. Michael's Hospitals are also in the midst of making further extensions. All this serves to underline the urgent need for increased student facilities and a general modernization programme at the Toronto General Hospital.

The annual refresher courses, both for specialists and for general practitioners, continue to attract large numbers of students. The short course, sponsored by the Alumni, will this autumn be combined with the course previously sponsored by the Ontario Medical Association.

The Alumni Association continues to give active support to the school. The number of scholarships has again been increased, so that there is at present an Alumni Scholarship in each of the six years, as well as four bursaries of \$100 each available in the medical years.



The Alumni Association was again host to the members of the graduating year, and to those members of the class of 1900 who could attend, on the eve of graduation. Professor Chassar Moir was the guest speaker and the dinner, held in the Great Hall of Hart House, was a memorable occasion.

Several members of the Faculty have retired from the active teaching staff. Professor H. B. Van Wyck, who has for the past four years directed with signal success the Department of Obstetrics and Gynaecology, will be succeeded in that chair by Dr. Douglas Cannell. Dr. Cannell, who previously has been a member of the Toronto Western Hospital staff, will be transferred to the Toronto General Hospital, where he will become Obstetrician and Gynaecologist in Chief to that Hospital. Dr. Van Wyck will continue to be a member of the Faculty as a lecturer in the Humanities in Medicine, a course in which he has collaborated during the past two years with Professor Wasteneys. We are delighted that he has agreed to continue this brilliant lecture series.

Dr. Harold Wookey retires from the post of Associate Professor and director of the surgical service on Ward B of the General Hospital, but will continue to give the benefit of his long experience to the cancer follow-up clinic in the Dunlap Building. It is hoped that some arrangement may be made whereby the knowledge and experience of such men may continue to be utilized in postgraduate teaching. Some men may be ready and anxious to be relieved of their major teaching responsibilities at the age of sixty, but many are strong and vigorous and their experience as teachers and specialists should not be entirely lost to the school.

Other retirements include those of Dr. C. A. Rae and Dr. A. H. Veitch in the Department of Oto-Laryngology, and Dr. Gordon Bates, Dr. E. A. Broughton, Dr. E. J. Trow, and Dr. G. F. Boyer in the Department of Medicine. Dr. W. L. Robinson has also retired from his University post in the Department of Pathology.

Professor R. B. Kerr, who has been in charge of Therapeutics, leaves us to be Professor of Medicine and Head of the Department in the new Faculty of Medicine in the University of British Columbia. Dr. Kerr will be sorely missed in our school. He has been chairman of the Committee on Postgraduate Studies, a post in which he has served with vigour and diligence. Our best wishes go with him in his challenging new venture.

We regret to record the death of Dr. Fletcher McPhedran. He retired from the active teaching staff two years ago, but generations of students will be saddened, as we were, to hear of his passing. He will long be remembered as a cheerful and stimulating teacher.

Another great teacher and firm friend of this school, Dr. William Goldie, died during the year. He retired from active teaching in June, 1928, but maintained an active interest in all the activities of the school until the time of his death. By the terms of his will the larger part of his considerable estate will be left to the Department of Medicine to be used for clinical research.

On March 15 there was unveiled in the Council Room of the Faculty of Medicine a bronze plaque, executed by Mr. Cleeve Horne, in memory of the late Professor C. L. Starr. Colonel Starr will be remembered by many of the older graduates as coming back from World War I and being appointed the first full-time professor in the reorganization that took place at that time. The artist has successfully reproduced in lasting bronze something of the man's great personality, which was a blend of kindliness, firmness, and honesty. The donors have indicated that the plaque should ultimately be placed in the Lecture Theatre at the Toronto General Hospital when plans for the new theatre have been completed.

The Faculty Council has for the past few years taken an increasing interest in the University Health Service, which has since the war been under the vigorous and enlightened direction of Dr. C. D. Gossage, O.B.E. Dr. Gossage leaves the Health Service for full-time work with another organization. His place will be taken by Dr. G. Woodhouse, M.C.



Research in all departments has been active and covers an extraordinarily wide field. The expanded facilities in the laboratories of Pathological Chemistry, devoted to steroid chemistry, have been taxed to their capacity since they were opened. The increasing availability of cortisone and ACTH under a federal scheme of supply has necessitated increased staff and laboratory space, in order to assay properly the involved and complex effects of these new compounds in human physiology and pathology. Likewise, the isotope laboratory has been in use for the past eight months and is proving of value in the dispensing and study of radioactive isotopes for human use.

We have been honoured during the session by many distinguished visitors. Sir James Learmonth, Professor of Surgery at Edinburgh University, delivered the Balfour Lecture in October. He spent three or four days with the Department of Surgery making rounds at all the teaching hospitals. Lord Webb-Johnson, the immediate Past President of the Royal College of Surgeons of England, spent a week here in the autumn and the degree of LL.D. (*honoris causa*) was conferred on him by the University. Dr. F. G. Young of Cambridge gave the Banting Memorial Lecture, and Dr. Sidney Portis of Chicago the Phi Delta Epsilon Lecture. Sir Lionel Whitby of Cambridge, Sir James Parkinson of London, Professor Chassar Moir of Oxford, Professor F. H. Bentley of Durham, Professor Johan Holst of Oslo, Norway, and many others from medical centres throughout the world have visited us for varying periods, and on many occasions they have addressed the final-year students and the graduate students in their particular specialty.

The Medical Library is facing a considerable problem in maintaining its standards of book purchases, binding of journals, etc. owing to the tremendous increase in costs in the publishing field. Confronted with these difficulties, we are at the same time unable to get an increased appropriation in the budget, and indeed this year we have been asked to reduce our appropriation to some extent. We shall probably make a local appeal to some of the firms in the city for the establishment of a special Medical Library fund. On the other hand, we are happy to acknowledge the fact that one of our graduates and a member of the staff in Ophthalmology, Dr. A. E. MacDonald, has given an amount of \$2,000 to help build up a fund which will be used for the establishment of a library of ophthalmology to be situated in a special eye hospital and centre.

### *Honours*

The Professor of Medicine, Dr. Farquharson, was honoured by the Royal College of Physicians of England. In June of this year he was admitted as a Fellow of the College.

Professor Best was elected a member of the American Philosophical Society. The degree of LL.D. (*honoris causa*) was conferred on him by Queen's University. He was also made a foreign associate of the National Academy of Sciences, Fellow of the American Association for the Advancement of Science, honorary member of the Italian Society of Endocrinology, and honorary member of the Czech Endocrinological Society. He was awarded the Flavelle Medal of the Royal Society of Canada.

Professor Stanley Hartroft was awarded the 1949 Royal College of Physicians (Canada) Prize for Research. Professor Bruno Mendel was elected a member of the New York Academy of Medicine, and Professor W. R. Franks received the Theodore C. Lyster Award from the Aero Medical Association (U.S.A.).

Miss M. T. Wishart, the Director of the course in Art as Applied to Medicine, was appointed Chairman of the Board of Governors of the International Association of Medical Illustrators for the year 1949-50.

Dr. K. G. Gray was appointed by the Government of Ontario as chairman of a special committee to survey mental health facilities in the province. Dr. Gray was also elected a Fellow of the American Psychiatric Association and Vice-President of the International Academy of Social and Legal Medicine. Dr. C. B. Farrar, Professor

Emeritus of Psychiatry, was elected Honorary President of the Osler Society of the University of Western Ontario.

Dr. Arthur Singleton was elected Chairman of the Canadian delegation to the International Congress of Radiology held in London in July, 1950. Dr. Ash was elected a member of the Faculty of Radiologists of London, England, and also was admitted to membership in the American Radium Society. Dr. Shannon was appointed to the council of the Radiological Society of North America.

The Professor of Surgery, Dr. R. M. Janes, delivered the Mitchell Lecture in Belfast, his subject being "Surgery and Pulmonary Tuberculosis," and the MacArthur Lecture in Edinburgh on "Lobectomy and Pneumonectomy for Pulmonary Tuberculosis," in May, 1950.

Dr. K. G. McKenzie is President of the American Society of Neurological Surgeons and Dr. E. H. Botterell President of the American Academy of Neuro-Surgeons. Dr. W. G. Bigelow was awarded the George Armstrong Peters Prize in Surgery, and has been elected to the Society for Vascular Surgery.

I acknowledge again with grateful appreciation the always efficient, cheerful, and untiring efforts of those who work with me in the various departmental offices at the everyday duties of office administration.

J. A. MACFARLANE, *Dean*



## Medical Society

(September, 1949, to June, 1950)

<i>Honorary President</i> . . . . .	Dr. J. A. MacFarlane
<i>Honorary Secretary-Treasurer</i> . . . . .	Dr. H. Wasteneys
<i>President</i> . . . . .	R. F. Hetherington
<i>Vice-President</i> . . . . .	G. S. Cameron
<i>Treasurer</i> . . . . .	A. R. K. Doyle
<i>Secretary</i> . . . . .	J. F. Mustard

The activities of the Medical Society come under the broad general headings of social, cultural, publications, student service, general administrative, and athletic. In each, significant activity was manifest during the academic year 1949-50.

"Panacea," an all-Varsity fall informal dance, was inaugurated and sponsored by the Medical Society. Over 600 couples enjoyed such varied entertainments as dancing, old-time and new, movies, floor show, aquatic display, chamber music, and refreshments. The success of the function indicates that succeeding generations of Medsmen will follow suit and one night of each year play host to their colleagues of other faculties.

The Medical At-Home, held at the Royal York Hotel on February 15, was even more magnificent than previously, with considerably augmented ballroom and refreshment space. Ballroom dancing in the Concert Hall, a cabaret in the Crystal Ballroom, a floor show and refreshments in luxurious surroundings provided an ideal evening for over 725 couples—a much larger attendance than formerly.

About 200 students, working in various capacities, emphasized original music, lyrics, and staging to produce an ambitiously conceived and polished "Daffydil" in Hart House Theatre last December. Over 2,000 spectators visited the packed theatre during the four performances and many more were turned away. It is obvious that present facilities are inadequate and some thought should be given to this problem.

At the annual Soph-Frosh Dance couples from each of the premedical years were so divided and seated that each year was represented at each table. In this way a spirit of friendship and unity between those of the two junior years of the Faculty was encouraged and achieved.

The Medical Arts and Letters Club organized and held eight afternoon meetings and a Sunday evening concert. On two occasions senior faculty members were speakers, Professors Van Wyck and Boyd. About 130 students attended the Sunday evening concert at which undergraduate artists presented a varied program of folk songs and solo numbers. Recommendations have been adopted to extend the scope of the Club and to increase participation by fostering group participation in painting, debating, the various musical arts, etc. A plan is also under way to establish an historical society.

Six issues of the *University of Toronto Medical Journal* were published by the Society this past year. The total number of pages devoted to articles was 316. This represents an increase of one-third since 1948. There were twenty-one articles by students, ten by recent graduates, and eighteen by staff members. The list of annual subscribers is also increasing and is now two and one-half times that of the 1948 volume.

An entirely new publication was inaugurated this past year, the medical year book, *Palinodia*. The book comprises forty-four pages and consists of a pictorial review of the activities of the Society. Distributed in early May, the new year book was well received and promises to become an annual publication of the Medical Society.



Student service activities were again undertaken conscientiously by the Society. An amount in excess of \$800 was donated to various charities and organizations, including \$460 presented to the Hospital for Sick Children Fund.

The local committee of the Canadian Association of Medical Students and Internes again provided a series of afternoon movies on medical topics and the Canadian Interne Placement Service was utilized by the graduating year to obtain interne appointments.

As in former years, the members of the first premedical year became acquainted with one another, with the activities available to them, and with the traditions of the Society and Faculty at a freshman reception.

Seventy-three percent of the eligible electorate cast their ballots at the medical elections in early March. Competition was very keen and it was necessary for the Chief Returning Officer to cast two deciding ballots.

Work is now in progress to select a proper Faculty crest of heraldic design to be used on rings, pins, blazers, stationery, etc. This will standardize our insignia and eliminate the confusing array of devices now existing.

A recommendation to abolish the Executive Honour Award in its present form and create a new award to be known as the Medical Society Honour Award has been approved. This would be given annually to approximately six persons in their graduating year, awarded on the basis of outstanding contribution to the undergraduate life of the Faculty during the student's entire course.

A final banquet meeting of the incoming and outgoing executive wound up the year's activities. The Honorary President, Dean MacFarlane, the outgoing Honorary Secretary-Treasurer, Dr. Wasteneys, and the incoming Honorary Secretary-Treasurer, Dr. Kerr, attended the meeting and heard the reading of the financial reports and the presentation of the budgets.

R. F. HETHERINGTON

Medical Athletic Association

(September, 1949, to June, 1950)

<i>Honorary President</i>	Dr. Philip H. Greey
<i>President</i>	E. D. Hubbard
<i>Vice-President</i>	R. A. Haliburton
<i>Secretary-Treasurer</i>	J. R. Evans
<i>Publicity</i>	W. F. Mackenzie
<i>IV Medical Representative</i>	R. Volpé
<i>III Medical Representative</i>	E. E. Ricci
<i>II Medical Representative</i>	P. S. Rosen
<i>I Medical Representative</i>	R. O. Antoni
<i>II Premedical Representative</i>	C. P. Vernon
<i>I Premedical Representative</i>	P. G. Morse

In the fall, the Faculty was represented by two football, two soccer, and four lacrosse teams. The senior Meds lacrosse team won the intramural championship for the third time.

In the Meds track and field meet the premedical years took over the supremacy which 4T9 had held for four years. The attendance was less than the preceding year as all classes were not cancelled.

During the winter Meds had strong entries in hockey and basketball, but as in the past year swimming and water polo were the main winter sports. Meds won the senior intramural meet and the senior water polo team reached the semi-finals, the premedical years again being largely represented among the participants. The volleyball championship was won for the second time.

On March 20, the Embassy was the scene of the annual Medical Athletic Dance. The Dean was present and also Dr. Philip Greey. Dr. Greey presented the awards, including the new intramural championship bookends.

The budget for this year has been larger than before, amounting to \$3,400, \$2,400 of this being spent on equipping the increasing number of Faculty teams.

In intercollegiate sports Medicine was represented by more than twenty men. There were approximately 400 in intramural athletics. There was an increase in participants in golf this year through the efforts of the year representatives.

This year the loss of 4T9 with its many athletes has been apparent, but the premedical years have taken to athletics with an enthusiasm not seen in the past.

The Medical Athletic Stick will be awarded at the close of the year to the author.

E. D. HUBBARD

Medical Women's Undergraduate Association

(September, 1949, to June, 1950)

Honorary President . . . . .	Dr. Florence McConney
President . . . . .	Miss D. M. Stillwell
Vice-President . . . . .	Miss R. Alison
Treasurer . . . . .	Miss A. J. Carter
Secretary . . . . .	Miss E. J. McCree

The activities of the M.W.U.A. fall easily into three distinct groups.

Medical Society activities

There is close co-operation between the M.W.U.A. and Medical Society. This is particularly true in social, cultural, and student service activities as well as publications. The success of these activities has already been outlined in Mr. Hetherington's report of the Medical Society for 1949-50.

Social activities

The purpose of such activities is to acquaint all members of the Association with each other and with as many members of the Women's Medical Alumnae as possible. To achieve this aim the following programme was followed:

- (a) Dr. Florence McConney was appointed Honorary President and very ably filled this position.
- (b) The girls entering first premedical year were met by members of the final year, who helped them register, and showed them the Medical Building, Anatomy Building, and the Medical Reading Room. They were then taken to lunch. That evening they were entertained at the Women's College Hospital, where they were taken on a conducted tour of the hospital.
- (c) The members of the second premedical year undertook the initiation, which chiefly involved a quiet party in the M.W.U.A. common room in the Medical Building.
- (d) The banquet was held in October, and was attended by all members of the Association, and about fifteen members of the Alumnae. The guest speaker was Dr. Marjorie Davis. The new members of the Association were formally initiated.
- (e) The Christmas party, although not planned by the M.W.U.A., must be mentioned because it brought the members of the junior and senior years into closer contact. It was given by Dr. McConney at her home, and was most successful.
- (f) Two forums were held after Christmas. The first was a musical evening, and the guest speaker was Dr. McConney. The second was more formal. Dr. Agnes Topping White spoke on the Federation of Canadian Medical Women. Other guests



were Dr. McConney, Dr. Frances Stewart, and Dr. Isabel Ayre, who composed a panel. Discussion followed on the Federation, summer internships, and opportunities for postgraduate training in various fields.

*Athletics*

The Medical Women's Athletic Association completed a very successful year, considering the number of girls available to compose teams. The baseball team and the hockey team reached the semi-finals. The basketball team tied for third place among all University teams. The volleyball team succeeded in reaching the finals before being eliminated. The girls of the Faculty were also active in swimming, badminton, and tennis. Beginning in 1950-51, the President of the M.W.A.A. will be a voting member of the M.W.U.A. executive, and it is hoped that in this way even closer co-operation will be achieved between the two groups.

Suggestions to the following executives aim toward an even more active association. The greatest weakness at present is lack of sufficient opportunity for members of the junior and senior years to become acquainted. This is of extreme importance, particularly to those of the lower years. There is much information which might be passed on to them concerning books, instruments, the classes they must attend, and the clinical aspect of their course. The encouragement and understanding of those who have gone before is invaluable. It is hoped that this will be attained through smaller and more frequent group meetings. I am confident that with the excellent calibre of the new executive, such will be the case.

DOROTHY M. STILLWELL

*Medical Women's Athletic Association*  
(September, 1949, to June, 1950)

<i>President</i> . . . . .	Miss Joan Fletcher
<i>Vice-President</i> . . . . .	Miss E. Line
<i>Treasurer</i> . . . . .	Miss Irene Hain
<i>Secretary</i> . . . . .	Miss Sally Sarles

The women of the Faculty had a most successful year. Teams were entered in the four major sports, basketball, baseball, volleyball, and hockey. In each sport they headed their league. An interfaculty tennis tournament was held in the fall and the winning players entered the interfaculty competition. Informal badminton nights were held throughout the year, and from this group a team was entered in the interfaculty tournament.

A swimming team was made up of undergraduates of Nursing, Physiotherapy, Occupational Therapy, and Medicine. This team won the University swim meet.

A baseball day was held one Saturday afternoon in which the four medical years took on the two premedical years, the latter being the winners.

A splash party was held in the winter at the Lillian Massey building under the direction of Bernice Russell, an undergraduate who is also an excellent swimming instructor.

The annual banquet of the Association was held at the Diet Kitchen on March 21. Dr. Cameron Gray, the guest speaker, talked on the situation of amateur versus professional sport, particularly in the field of football. At the end of the banquet, a movie was shown of the final football game between Montreal and Calgary. At the banquet the following awards were presented: one premedical bar, six medical M's, five junior T's, and one senior T with shield.

In conjunction with the Women's Undergraduate Association, a change was made in the constitution permitting the President of the Athletic Association to be

a member of the Undergraduate Association executive. This change will facilitate co-ordination between the two executives.

JOAN FLETCHER

*Fellowships, Scholarships, Medals, and Prizes*

*Awarded at Convocation, June, 1950*

GRADUATE

The William Goldie Prize . . . . .	R. M. TAYLOR, B.A., M.D., F.R.C.P.(C) J. G. WATT, M.D., F.R.C.P.(C)
The Arch Hutchison Fellowship . . . . .	O. KOFMAN, M.D.
The Frances Esther Hutchison Fellowship . . . . .	J. E. C. COLE, M.D.
The Alexander McPhedran Research Fellowship in Medicine . . . . .	LOIS A. LLOYD, B.A., M.D.
The Canadian National Institute for the Blind Fellowship in Ocular Genetics . . . . .	G. A. THOMPSON, M.D.
The Percy Hermant Fellowships in Ophthalmology . . . . .	G. G. COUSINEAU, M.D. P. H. KOZIAK, M.D.
The E. P. Taylor Fellowships in Oto-Laryngology . . . . .	J. K. BRYDON SMITH, M.D. H. O. BARBER, M.D.

FOURTH MEDICAL YEAR

The Cody Gold Medal . . . . .	R. F. HETHERINGTON
The Cody Silver Medal . . . . .	D. I. GOVE
The Cody Silver Medal . . . . .	R. M. HINES
The Chappell Prize in Clinical Medicine . . . . .	R. M. HINES
The Chappell Prize in Clinical Surgery . . . . .	J. F. H. STEWART
The David Dunlap Memorial Scholarship . . . . .	R. M. HINES
The Ellen Mickle Fellowship . . . . .	R. F. HETHERINGTON
The Hendry Memorial Scholarship . . . . .	R. C. ROADHOUSE
The Ontario Medical Association Prize in Preventive Medicine . . . . .	R. M. HINES
The Doctor Roy Simpson Scholarship in Paediatrics . . . . .	R. F. HETHERINGTON

THIRD MEDICAL YEAR

The Ronald S. Saddington Medal in Pathology . . . . .	Miss A. C. BEATON
The Sandoz Prize in Pharmacology . . . . .	G. E. GRAY
The Class of 1924 War Service Scholarship . . . . .	D. A. SMITH

SECOND MEDICAL YEAR

The John Copp Bursary . . . . .	J. R. EVANS
The Posluns Brothers Scholarship . . . . .	Miss F. M. HILL

SECOND PREMEDICAL YEAR

The Alec Garalick Scholarship . . . . .	H. P. BRENT
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*Registration of Students in the Faculty of Medicine*

Session 1950-1

First premedical year . . . . .	149
Second premedical year . . . . .	143
First medical year . . . . .	163
Second medical year . . . . .	157
Third medical year . . . . .	178
Fourth medical year . . . . .	174
Art as Applied to Medicine . . . . .	11
Physical and Occupational Therapy . . . . .	213
Bachelor of Science in Medicine . . . . .	2
Diploma in Public Health . . . . .	14
Diploma in Psychiatry . . . . .	8
Diploma in Radiology . . . . .	3
Diploma in Medical Radiology . . . . .	6
Graduate students . . . . .	71
	1,292
Advanced graduate course (Medicine, Surgery, Obstetrics and Gynaecology) . . . . .	66



Anatomy

Under the direction of Professor J. C. B. Grant

Last year 942 undergraduate and graduate students worked in the Department; this year the number had fallen to 774. They were distributed among the various courses as follows:

UNDERGRADUATE COURSES IN GROSS ANATOMY			
1. Medical, first year . . . . .	166		
Art as Applied to Medicine . . . . .	3		
2. Dental, first year . . . . .	79		
3. Physical Therapy, first year . . . . .	22		
4. Physical Therapy, second year . . . . .	14		
5. Occupational Therapy, first year . . . . .	53		
6. Occupational Therapy, second year . . . . .	33		
7. Physical and Health Education, second year . . . . .	42		
8. Physical and Health Education, third year . . . . .	80		
9. Optometry . . . . .	48	540	
GRADUATE COURSES IN GROSS ANATOMY			
10. M.S., F.R.C.S., and Radiology (evening courses) . . . . .	52		
11. Ophthalmology . . . . .	13		
12. Oto-Laryngology . . . . .	8		
13. Dental Specialties (B.Sc. (Dent.)) . . . . .	6		
14. Demonstrators of Anatomy to medical students . . . . .	6		
15. Demonstrators of Anatomy to dental students . . . . .	4		
16. Anaesthesia . . . . .	11		
17. Postgraduate course in Medicine (Neurology) . . . . .	25		
18. Postgraduate course in Surgery . . . . .	25		
19. Postgraduate course in Obstetrics and Gynaecology . . . . .	14		
20. Graduate Nurses . . . . .	18		
21. Graduate Dentists			
Applied Anatomy . . . . .	7		
Course in Surgery . . . . .	21	210	
UNDERGRADUATE COURSES IN HISTOLOGY			
22. Medical, first year . . . . .	166		
Art as Applied to Medicine . . . . .	3		
23. Dental, first year . . . . .	79		
24. Physical and Health Education, second year . . . . .	42		
25. Physiology and Biochemistry, second year . . . . .	15		
26. Occasional and Graduate School students . . . . .	6	21	
POSTGRADUATE RESEARCH STUDENTS			
27. Graduate research students . . . . .	3	3	
TOTAL		774	

Much of the time and energy of the staff was, and will continue to be, taken up with these classes. For, whereas the number of students may decrease, the number of classes does not diminish.

Dr. J. V. Basmajian has been appointed to the staff as Lecturer in Anatomy. He graduated M.D. in 1945, and was a silver medalist of that year. He had formerly acted as Demonstrator of Anatomy in this Department, and now he returns as Lecturer. His enthusiasm and his abilities should assure him a bright future.

Mr. George Ross, Chief Laboratory Assistant in Histology, who has been Pipe Major in charge of the University of Toronto Pipe Band since 1942 and who has for a long time been active in the St. John Ambulance, has been promoted to the rank of Corps Officer in the Toronto Corps Headquarters of the St. John Ambulance Association. He was given the St. John Ambulance "Priory Vote of Thanks" award for work done for the Order in Canada.

Dr. Ham's long-expected text-book on *Histology* has appeared. On account of its novel presentation, wide scope, and the originality and excellence of its illustrations, it has elicited far-reaching approval.

#### RESEARCH

##### *Under the direction of Professor S. H. Bensley*

Dr. Tobie Muller of Pretoria University, Union of South Africa, as a visiting Fellow in the Department of Anatomy, has studied the effect of estrogen on the loose connective tissue of the albino rat. She has found that estrogen is an important factor in the production and maturation of the intercellular substances of connective tissue and that its action is considerably modified by hormones produced by the pituitary and adrenal glands.

Dr. Bensley collaborated with Mr. C. Monkhouse in the Department of Physiology in histological studies of tissue changes associated with (1) intravenous administration of heparin in the rat, and (2) anaphylactic shock in the dog.

Dr. Bensley continued her study of mast cells in relation to changes in the intercellular substances of connective tissue produced experimentally and by disease.

##### *Under the direction of Professor A. W. Ham*

In order to determine whether or not there are any specific features of malignant cells it is necessary to compare them with actively growing non-malignant cells of the same type. Regenerating liver tissue may be obtained from rats by means of a simple experimental procedure. To obtain rat liver tumour tissue in quantities Dr. M. I. Armstrong, in collaboration with Dr. Alice Gray, has now cultivated over twenty-five butter-yellow-induced rat liver tumours in fertile eggs and four have grown luxuriantly on serial transfer. Sufficient tumour tissue from this source is, therefore, now available to permit an extensive comparative study with regenerating liver cells to be made.

Dr. Marjorie Mosbaugh is using the mouse mammary tumour grown in the yolk sacs of fertile eggs as a means of testing a variety of substances for their possible efficacy in inhibiting the growth of tumour cells.

L. Warren has transplanted the adrenal glands of a large number of rats to their spleens so that the cortical hormones pass into the portal circulation instead of into the systemic. This study, amongst other results, should provide information as to the sites in the body where adrenal cortical hormones are inactivated.

Dr. Ham has collaborated with Dr. Stuart Gordon of the Department of Surgery in studying the fate and effects of transplanted thrice-frozen and thawed cancellous bone fragments.

##### *Under the direction of Professor J. C. B. Grant*

Dr. L. F. Levy has developed a technique for straining macroscopic structures and embedding them in plastic. Sections of the brain are particularly informative when so treated. Dr. William Paul has completed for publication the results of his investigation of the various forms and terminations of the pancreatic ducts. His data are derived from corrosion preparation.

C. E. Storton has continued to investigate by corrosion methods the portal circulation. He has also continued work on the broncho-pulmonary segments and on the pulmonary arteries and pulmonary veins.

##### *Under the direction of Professor C. G. Smith*

The incidence of neuroglial nodules on the stalk of the pineal gland and the relationship between these and the roentgenogram of the pineal gland were studied. The incidence was found to be high, 92 per cent, and to be similar in the two



sexes and in young and aged adults. When the nodules were calcified they were found to be responsible for the characteristic caplike anterior portion of the pineal gland shadow.

The survival time of the retina under conditions of increased intra-ocular pressure was investigated by Dr. C. D. Baird. He has demonstrated that with a pressure high enough to collapse the retinal vessels the retina can survive, judging from its histological appearance, after being deprived of its blood supply for up to ten minutes. This work is being continued.

*Under the direction of Professor J. C. Watt*

Dr. Watt has collected extensive data on the arrangements of the venous sinuses of the cranium. He is preparing for publication the results of his research.

PUBLICATIONS

- ARMSTRONG, M. I. and HAM, A. W. "Effects on chicks, particularly anemia and hypoglycemia, of serially transferred mouse mammary yolk sac tumours" (*Acta*, vol. 6, 1949, pp. 571-5).  
 HAM, A. W. *Histology*. Philadelphia: J. B. Lippincott. 1950.  
 HARRIS, W. R. "The endocrine basis for slipping of the upper femoral epiphysis" (*Journal of Bone and Joint Surgery*, vol. 32B, 1950, pp. 5-11).  
 SMITH, C. G. "The anatomy of pain" (*University of Toronto Medical Journal*, vol. 27, 1949, p. 89).  
 ——— "The incidence of neuroglial nodules on the habenular commissure in man" (*Anatomical Record*, vol. 106, 1950, p. 122).

## *Department of Art as Applied to Medicine*

*Under the direction of Miss Maria T. Wishart*

This Department has functioned throughout the year in its dual capacity—as a department of illustration serving the Faculty of Medicine and as a teaching department for the training of medical illustrators.

The extent and type of illustration work undertaken and the results in teaching have been both pleasing and encouraging.

Our records show an increase of 75 per cent in the number of individuals served in any one year over the last five-year period.

Some idea of the range of work undertaken is evidenced by the following: animated drawings for insertion in a motion picture on "Atrio ventricular anastomosis"; coloured wall charts for the Forest Hill Village project under the National Committee of Mental Hygiene and the University of Toronto, Dominion Government Mental Health Grant of the Province of Ontario; assignments for the National Film Board, the Peterborough Clinic, and the Women's College Hospital; illustrations for two text-books under preparation. Two interesting illustrative problems undertaken by Miss Blackstock were (1) slit lamp studies of aneurysms of the conjunctiva in diabetic patients, (2) "arcuate sponge—pictorial reconstruction of consecutive serial sections of renal anatomy." Mrs. Louise Gordon carried out graphic illustrations of surgical steps for (1) removal of acoustic neuroma, (2) repairing of temporo-mandibular joint.

Mrs. Louise Gordon, B.A. Queen's, O.C.E., Art as Applied to Medicine, Toronto, 1949, was appointed Frosst Fellow and Instructor in the Department. During the summer months between her second and third year in the medical illustration course, Mrs. Gordon worked with Dr. A. W. Ham contributing many very fine illustrations to his recently published book on *Histology*.

A further addition to the staff is Mrs. E. Furness as part-time letterer. In the past few years the demand for charts and graphs has grown steadily. This work can be undertaken by an artist without a knowledge of scientific subjects.



The field served by the Department is enlarging. As this is now an established, experienced illustration and teaching department we find allied fields of medicine calling on our services. In the interests of providing a standard of good medical illustration for Canada and of developing the field for those we are training, we welcome this opportunity. At the same time we consider it a source of revenue which can be used to advance the needs of the Department. A system of charging for these outside services has been established, the earnings being deposited to an income account. It will, however, be recognized that to meet the growing needs of the Faculty and the teaching demands, an increase in staff, equipment, and accommodation is required. As a means of further contributing to the financing of these requirements consideration is being given to the establishment of a graduated scale of charges for university work under such categories as text-books; working under "a grant" of any nature; etc.

The students in Art as Applied to Medicine take the courses in Anatomy, Histology, and Pathology with the medical students, writing the same examinations. Their standing in these subjects has made it advisable to include Physics, Chemistry, and Zoology (Grade XIII) as obligatory prerequisite requirements. During the past year we had 10 students. The method of instruction and the results gained show steady and satisfactory improvement. The teaching from the illustration angle is necessarily almost entirely individual. The dual functions of the Department complement one another. The teaching provides the instructors with an opportunity to review their anatomy. The active illustrating service provides indirectly the best of teaching material. Our purpose is to keep the teaching programme flexible while attempting to find a sound and direct approach to our objectives.

## Biochemistry

*Under the direction of Professor H. Wasteneys*

There have been no changes in the staff of the Department during the year except for the usual replacements among the demonstrators. The distribution of responsibility for instruction among the staff was the same as that reported for 1948-9.

There was a reduction in the number of students, as compared to the previous year, from 555 to 453. There were 89 fewer students from Dentistry, 24 fewer in Medicine, and 22 fewer from the Household Economics course; the numbers in other courses were increased slightly. The net reduction of 102 students taking courses in the Department made it possible to accommodate students in the laboratories with more comfort and efficiency.

Two students of the Department, Messrs. D. B. Smith and A. W. Jackson, were granted the Ph.D. degree during the year. Two, Drs. J. A. Little and C. G. Stewart, received the M.A. degree and one, Dr. G. A. Lau, received the B.Sc.Med. degree.

Generous grants from the National Cancer Institute of Canada, the Foster Bequest, the Banting Research Foundation, the University's Advisory Committee on Scientific Research, and the National Research Council have continued to facilitate our programme of research which is described below.

I feel that we should also express our appreciation of the courteous co-operation of members of the staff of the Atomic Energy Project at Chalk River in making isotopes available for the researches of Professors Butler and Fisher.

It is a pleasure to record once more our appreciation of the efficiency with which each member of the technical staff has performed his or her duties.

The total number of students registered in the Department during the session was 453. This number was made up of 159 medical students, 25 students of the General Course, 54 in the Physiology and Biochemistry course, 21 in Biology, 14 in



Food Chemistry, 28 in Household Economics, 3 in Household Science, 80 in Dentistry, 7 occasional students, and 62 graduate students. Of the graduate students, 28 were candidates for the Ph.D. degree, 22 for the M.A., 1 for the B.Sc.Med., and 11 were not proceeding to a degree. Thirteen of these students were candidates for the Ph.D. degree in Biochemistry, 8 for the M.A., and 1 for the B.Sc.Med. degree.

## RESEARCH

### *Under the direction of Professor A. M. Wynne*

Dr. H. B. Stewart has continued the investigation of the reaction of chloramine-T with amino acids and related compounds; and he has resumed his study of the properties and chemical nature of cytochrome c.

Mr. W. L. Holmes has made further studies of the influence of mammary and hepatic carcinomata, serially transferred in fertile eggs, on the cytochrome oxidase content of the tissues of the developing chick embryo. His study of the stability of cytochrome c has been completed.

Dr. C. G. Stewart has completed his studies of the response of normal human subjects and of patients suffering from malignant neoplasia to large oral doses of glucose. The response was evaluated in terms of blood levels of glucose, pyruvate, and lactate.

Mr. Holmes and Dr. C. G. Stewart have jointly undertaken an investigation of the comparative efficiency of oxidative phosphorylation in normal and cancerous tissues.

Mr. Tadeusz Bojarski of the University of Warsaw, who has held a UNESCO fellowship, has investigated the kinetics of the enzyme, lysine decarboxylase of *Bacterium cadaveris*.

### *Under the direction of Professor G. C. Butler*

Mr. R. O. Hurst has investigated the action of phosphatases on the oligonucleotide obtained from thymonucleic acid. The sources of the enzymes were intestinal mucosa and the venoms of the rattlesnake and Russell's viper, all of which contain a phosphomonoesterase and a phosphodiesterase. The phosphomonoesterase has been removed selectively from Russell's viper venom leaving an enzyme preparation which will hydrolyse the oligonucleotide to mononucleotides. The resulting mixture has been separated by chromatography with an anion-exchange resin. Four fractions were obtained corresponding to the four mononucleotides expected and these are receiving chemical study.

Dr. A. M. Marko has developed a new method for isolating desoxyribonucleic acid from tissues, using dodecyl sulphate to precipitate the protein portion of the nucleoprotein. The method is more rapid, less laborious, and gives higher yields than procedures previously used. It has proved to be satisfactory both on a large and on a small scale with thymus, spleen, pancreas, liver, testis, and avian blood. The products obtained appeared uniformly to be highly polymerized and as pure as those resulting from other methods of isolation.

Mrs. M. A. Packham is studying the role of lactic acid in the synthesis of glucuronic acid by the rat, with the aid of  $C^{14}$ . When lactic acid synthesized with  $C^{14}$  in the carboxyl group was administered to rats previously dosed with  $\alpha$ -naphthol, significant amounts of  $C^{14}$  appeared in the excreted naphthol glucuronide. From the results of eight experiments it may be concluded that the incorporation of the lactate carbon into the glucuronide is much greater than in the liver glycogen and is greater than the incorporation found in control experiments in which  $C^{14}$ -labelled bicarbonate was given. The research is continuing with the use of lactate synthesized with  $C^{14}$  in the  $\alpha$  and  $\beta$  carbons.



*Under the direction of Professor B. F. Crocker*

Mr. J. L. Koppel and Mr. C. J. Porter have been continuing their study of the metabolism of enzymes. A series of carbon and of nitrogen sources have been tested for activity in stimulating the formation of fumarase in cultures of *Micrococcus lysodeikticus* grown for twenty-four hours. Of the former, fumaric and lactic acids, and of the latter, asparagine and aspartic acid, were found to be the most active. Stimulation by fumaric acid has been found to be dependent on both its concentration in the medium and on the amount of nitrogen available to the cells in excess of that required for cell growth. Evidence has been obtained which indicates that the stimulatory effect of fumaric acid is increased under anaerobic conditions. The implications of this with regard to the mechanism involved are important and the phenomenon is being investigated further. Experiments are now being conducted to determine the conditions under which a reversible inhibition of multiplication of the cell during the period of stimulation of enzyme formation, which would not interfere too violently with other metabolic processes, can be brought about. This would make it possible to study the metabolism of this enzyme under conditions where the factor of natural selection cannot operate, and also to determine whether this stimulation is transmissible, once cell division is resumed.

*Under the direction of Professor J. M. Fisher*

Mr. J. S. Barlow has found that lithium, potassium, and radioactive sodium exchange so rapidly and so completely with all the sodium of chick muscle that its extracellular position is strongly suggested. A comparison of the rate of entrance, *in vivo*, of radioactive sodium (typically extracellular) with the entrance of radioactive potassium (usually intracellular) into a variety of tissues of young and adult chicks has likewise been obtained.

Miss A. P. Blake carried out some preliminary analyses of the salt and water in Rous sarcoma produced in hens and kindly provided by Dr. William R. Franks. These analyses were continued by Miss Jean Murphy. Miss Blake is investigating the effect of ions on the interaction of adenosine triphosphate and actomyosin fibres prepared from rabbit psoas muscle. The environment for maximum contraction having been determined, the fibres will now be analysed for K, Na, Cl and Mg. Because some criticism has recently been directed at the Van Slyke open Carius procedure for the determination of chloride in tissues, Miss Blake compared this procedure with the closed Carius method and found the former to be completely reliable.

Miss M. Taylor has completed her research on the seasonal variations in calcium, chloride, and water in frog muscle and plasma. The concentration of plasma calcium ions is remarkably constant throughout the year and hence cannot be related to hibernation.

The research on the relation of carbohydrate metabolism to intracellular potassium concentration has been extended, using leucocytes and frog muscle. External glucose caused a high intracellular potassium in leucocytes. Insulin (1 unit per 100 ml.) does not affect this result. Frog muscles have been shown to take in potassium in the presence of insulin and lactate; this uptake is abolished by iodoacetic acid.

The permeability of leucocytes to potassium and of dog red cells to sodium using radioactive potassium and sodium respectively has been investigated.

## PUBLICATIONS

- BARLOW, J. S. and MANERY, J. F. "Electrolytes in the muscle of young chicks" (*Federation Proceedings*, vol. 9, 1950, p. 8).  
 BUTLER, G. C. "The effect of X- and  $\gamma$ -rays on aqueous solutions of sodium thymonucleate" (*Canadian Journal of Research*, vol. B27, 1949, p. 972).  
 FLEMING, D. S., MOORE, A. M., and BUTLER, G. C. "Observations on antisera against complexes of di-2-chloroethyl sulphide and protein" (*Biochemical Journal*, vol. 45, 1949, p. 546).



- SIMPSON, S. D. and YOUNG, L. "Biochemical experiments with radioactive 2:3-dimercaptopropanol (BAL)" (*Biochemical Journal*, vol. 44, 1949, p. 25).
- SMITH, D. B. and SHEFFER, H. "Light-scattering studies of sodium thymonucleate" (*Canadian Journal of Research*, vol. B28, 1950, p. 96).
- WILSON, D. L. and MANERY, J. F. "The permeability of rabbit leucocytes to sodium, potassium and chloride" (*Journal of Cellular and Comparative Physiology*, vol. 34, 1949, pp. 493-520).
- WYNNE, A. M. "Intracellular oxidation and the biological transformation of energy"; in C. H. Best and N. B. Taylor, *Physiological basis of medical practice* (5th edition). Baltimore: Williams and Wilkins. 1950.

## Hygiene and Preventive Medicine

*Under the direction of Professor D. T. Fraser*

The total number of medical students in the fourth medical year receiving instruction in the Department was 159, which is the highest figure experienced. The large class in the fourth year is the second to be graduated since the inauguration of the new schedule in 1945. The staff feels encouraged to think that the teaching programme distributed over each of the four years is much more effective than formerly, when the subject was taught in the fifth year.

The summer internship in public health for members of the third medical year was granted to four students. The appointment is for the three summer months during which time an opportunity is given to participate in the activities of urban and rural health units in the province. The student is required to submit a report upon his work. From a study of these it is evident that the students profited a great deal and acquired a first-hand knowledge of public health far beyond that given through didactic instruction. During the two years since the inauguration of the internships we have gained enough experience to feel confident that the principle is sound and enthusiastically endorse its continuation. The scheme is financed by a grant from the Department of National Health and Welfare through the Ontario Department of Health. It is a pleasure to acknowledge the enthusiastic co-operation of the directors of the health units concerned.

The total number of students receiving graduate instruction was 74. This is the largest group in the history of this Department and has in fact taxed the teaching and laboratory resources to the utmost. It is gratifying to report that of this number 6 were registered for the M.A. and 1 for the Ph.D. degree in the Department, and that 12 others received instruction in subjects elected as minors.

As in previous years it is evident that the University continues to attract students from many parts of Canada as well as from foreign countries. The enrolment of physicians for the diploma in Public Health for this session was 26. Of these, 12 were from Ontario, 2 from Newfoundland, 2 from Nova Scotia, 1 from New Brunswick, 1 from Prince Edward Island, 1 from Quebec, 2 from Manitoba, 1 from Alberta, 1 from British Columbia, 2 from Hong Kong, and 1 from Malaya. In other courses 6 students were registered for the diploma in Dental Public Health and 12 for the diploma in Veterinary Public Health. Seven students proceeding to the Master of Applied Science degree were given a special course in microbiology. As in previous years, courses of instruction in Bacteriology, Immunology, Parasitology, and Virus Infections were given to these students, and also to suitably qualified graduate students.

Laboratory courses and lectures were given as usual to the students in second-year Pharmacy, second- and third-year Household Science and Household Economics, third-year Physiology and Biochemistry, third-year Food Chemistry, and third-year Physical and Health Education, and to students in the School of Nursing,

The total enrolment of students receiving instruction in the Department is 1,228. Despite the decrease in enrolment of students in the University, this is the



highest figure since the inception of this Department. The enrolment for the session has been as follows:

Candidates for the diploma in Public Health . . . . .	26
Candidates for the diploma in Dental Public Health . . . . .	6
Candidates for the diploma in Veterinary Public Health . . . . .	12
Candidates for the degree of Master of Applied Science . . . . .	7
Candidates for the certificate in Public Health . . . . .	3
Candidates for the degree of Doctor of Veterinary Science . . . . .	1
Candidates for the degree of Doctor of Philosophy . . . . .	1
Candidates for the degree of Master of Arts . . . . .	6
Graduate students registered in other departments . . . . .	12
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Faculty of Medicine, Fourth year . . . . .	159
Third year . . . . .	177
Second year . . . . .	171
First year . . . . .	166
Faculty of Arts, Household Economics, second and third years . . . . .	78
Physiology and Biochemistry, third year . . . . .	31
Food Chemistry, third year . . . . .	12
Faculty of Household Science, second and third years . . . . .	9
School of Physical and Health Education, third year . . . . .	80
School of Nursing . . . . .	121
Ontario College of Pharmacy, second year . . . . .	150

RESEARCH

Dr. M. H. Brown is investigating methods of drying BCG vaccine and the preparation of tuberculin from the BCG strain. Dr. F. H. Fraser is conducting a study of the antibiotic activity of several strains of *Penicillium* against Gram-negative bacilli of the enteric group. Conditions affecting the production of active substance, its stability, and its isolation from crude filtrate have been investigated.

Dr. F. O. Wishart is continuing his studies of recall doses of diphtheria and tetanus toxoids in relation to long-term antitoxic immunity in school-children and medical students. The results of the response to tetanus toxoid given by the nasal route have been reported.

Dr. R. J. Wilson has continued his studies on the growth requirements of *H. pertussis*. It has been found that growth of this micro-organism can be supported by a simplified medium consisting of an acid hydrolysate of casein, salts, two accessory growth factors, and starch. More recently it has been possible to substitute activated charcoal for starch, and attempts are now being made to replace the casein hydrolysate by amino acids.

Miss Sheila Toshach has presented her study of *C. diphtheriae* phages as a thesis for the M.A. degree. She has shown that a strain of phage has by cultivation been adapted to a culture of diphtheria bacillus against which it was originally inactive, which finding gives some promise of practical application in classification. Electron micrographs have been obtained of diphtheria phage which has not been photographed heretofore. Miss Elizabeth Whittaker similarly has completed her thesis for the M.A. degree on phages active against members of the mycobacterium group. Mr. S. Lesley, registered for the M.A. degree, is studying the relationship between virus and host cell by means of radioactive isotope technique.

In the sub-department of Parasitology, under Dr. A. M. Fallis, the investigation of the incidence of *Trichinella spiralis* in the Arctic has been continued. Dr. Kuitunen spent two months at Lake Harbour, Baffin Island, collecting material and investigating at first hand trichinosis and other parasitic infections in dogs and other mammals. As a result of a study of upwards of one thousand diaphragms, trichinosis was established as occurring in polar bear, fox, and dogs. The co-operative study with Dr. Malcolm Brown, Queen's University, on stool samples, swabs, and sera has been reported. The incidence of diphyllbothrium and enterobius infection was over 30 per cent, a finding similar to the series at Lake Harbour.



## PUBLICATIONS

- BROWN, M., CRONK, L. B., DESINNER, F., GREEN, J. E., GIBBONS, J. E. and KUITUNEN-EKBAUM, E. "Trichinosis on Southampton Island, N.W.T." (*Canadian Journal of Public Health*, vol. 40, 1949, pp. 508-13).
- KUITUNEN-EKBAUM, E. "The occurrence of *Sarcotaces* in Canada" (*Journal of the Fisheries Research Board of Canada*, vol. 7, 1949, pp. 505-12).
- KUITUNEN-EKBAUM, E. and FLEMING, Z. W. "A note on trichinosis in dogs of the Canadian North" (*Canadian Journal of Public Health*, vol. 40, 1949, pp. 514-15).
- KUITUNEN-EKBAUM, E. and JAMES, D. M. "Diphenan in the treatment of enterobiasis" (*Canadian Journal of Public Health*, vol. 41, 1950, pp. 167-9).
- SELLERS, A. H., CALDBICK, G. D., FRASER, D. T., BROWN, M. H., and MOLONEY, P. J. "The use of a combined antigen—TABTD" (*Canadian Journal of Public Health*, vol. 41, 1950, pp. 141-5).
- TOSHACH, S. "A bacteriophage for *C. diphtheriae*" (*Canadian Journal of Public Health*, vol. 41, 1950, p. 38, abstract).
- WHITTAKER, E. I. "A bacteriophage for *Mycobacterium smegmatis*" (*Canadian Journal of Public Health*, vol. 41, 1950, p. 43, abstract).
- WISHART, F. O. and JACKSON, L. K. "Recall dose of tetanus toxoid by the intranasal or intraocular route" (*Canadian Journal of Public Health*, vol. 41, 1950, p. 43, abstract).

## Medicine

*Under the direction of Professor R. F. Farquharson*

The clinical post-war teaching load is just reaching its peak. The largest class (5T1) now passes into the third medical year and the demands on teachers' time are accordingly great. Graduate instruction of casual and short-term visitors has continued to increase. The usual advanced graduate course was given in the fall to capacity numbers.

The Department announces with regret the retirement of Drs. Gordon Bates, George F. Boyer, Ernest A. Broughton, and Emerson J. Trow and, at the same time, expresses appreciation of their long and faithful service.

Dr. Robert M. Taylor resigned from his recent appointment as Clinical Teacher to take over the Medical Service of the National Research Council Atomic Energy Project at Chalk River. He had done excellent work and was this year awarded the William Goldie Prize for Clinical Research.

The Department extends to Dr. Robert B. Kerr its best wishes on his appointment as Professor of Medicine in the University of British Columbia. He will be greatly missed as an outstanding teacher, a valued member of many committees, an excellent physician, and a talented and pleasing person. The University of British Columbia is to be greatly congratulated.

Dr. W. Hurst Brown succeeded Dr. H. K. Detweiler as Associate Professor of Medicine and as Physician-in-Chief to the Toronto Western Hospital.

Dr. H. H. Hyland succeeded Dr. R. G. Armour as Associate Professor of Medicine, in charge of Neurology, and as Head of the Medical Service on Ward G, Toronto General Hospital.

Dr. Robert C. Dickson was appointed Head of the Medical Service at the Wellesley Division of the Toronto General Hospital to succeed Dr. Neil B. McGillivray whose sudden death in 1949 was a great loss to the University and to all his colleagues.

The following clinical teachers have been appointed to the staff of the Department: Drs. J. F. Paterson, W. A. Rowland, O. H. Warwick, J. D. L. FitzGerald, and J. R. Bingham.

## RESEARCH

The investigation of the effect of dicumarol therapy in patients with cardiac infarction has been continued by cardiologists in the three University hospitals.



A combined study on the effect of different anticoagulants in various thrombo-embolic conditions has been undertaken by the Departments of Medicine, Surgery, and Obstetrics and Gynaecology and Dr. Peter Moloney of the Connaught Laboratories.

Drs. Greenwood and McKelvey have completed the construction of an apparatus for studying the changes in the sub-divisions of lung volume. They are using it in the study of the causes of dyspnoea in cardiac failure.

The introduction of ACTH and cortisone as agents with amazing physiological and therapeutic effects has opened a new field for investigation. Dr. M. Ogryzlo, working with Drs. Fletcher and Wallace Graham at Sunnybrook Hospital and at the Toronto General Hospital, has studied their effect in various types of arthritis and in a number of collagen diseases. Drs. Macdonald and MacKenzie, at Sunnybrook Hospital, have demonstrated a pronounced beneficial effect of cortisone in a severe case of steatorrhoea. Working with Dr. Wightman, Dr. Bardawill has been studying the metabolic changes which occur when patients suffering from leukaemia and allied diseases are treated with ACTH, urethane, and X-ray radiation. In collaboration with the Department of Ophthalmology, studies are in progress on the use of ACTH and cortisone in external diseases of the eye. Dr. FitzGerald has continued studies begun with Dr. C. McLean of Queen's University on the effect of cortisone administration on experimental nephritis. In all the work on cortisone and ACTH, as in many other matters, the collaboration of Dr. Dauphinee and his staff in the Department of Pathological Chemistry is greatly appreciated.

In association with Dr. K. J. R. Wightman, Dr. O. H. Warwick has been carrying out trials of new chemotherapeutic agents in leukaemia and lymphoblastoma; Dr. I. Rother has been exploring the usefulness of tissue imprints to clarify the pathology of lymph node disorders; Dr. J. G. Watt has continued his studies of the minimal requirements for liver extract in pernicious anaemia patients; Dr. MacMillan has continued his work on defects in blood coagulation; and a field expedition to study a large family of haemophiliacs in northern Ontario has been carried out.

Dr. Paul O'Sullivan, working with Dr. E. J. Maltby, has made a follow-up study of the progress of patients suffering from ulcerative colitis.

Dr. R. C. Dickson has studied the effect of administration of Tween 80 on the absorption of fat and carbohydrate in patients with steatorrhoea. Dr. Wightman has continued metabolic studies in patients with steatorrhoea.

Dr. W. R. Campbell has been working on a method for the rapid and more accurate determination of potassium in biological fluids.

Working in association with Dr. W. R. Campbell and with Dr. R. Mustard of the Department of Surgery, Dr. MacAllister Johnston has been studying the effectiveness of the administration of radio-iodine in treatment of carcinoma of the thyroid and certain types of goitre with or without hyperthyroidism, for which it appears to be the best method of therapy. Dr. Johnston and Dr. Squires have continued studies on the effect of administration of thyroid on the function of the thyroid gland; they have shown that patients with an intact thyroid gland are able to tolerate ingestion of thyroid, gradually increased till huge doses are administered, without any persistent increase in the basal metabolic rate or in the serum hormonal iodine level, and with little physiological disturbance.

Dr. H. E. Pugsley has been studying the effects of various antibiotics administered intramuscularly or as an aerosol on the clinical condition, amount of sputum, and the blood and sputum antibiotic levels of patients with chronic bronchiectasis.

Dr. William Clarke and Dr. R. C. Smith, working with Professor P. H. Greey, have continued to study the effect of various dosage schemes and different methods of administration of antibiotics, and the use of agents to raise the blood levels through interference with renal excretion.

Dr. H. H. Hyland and Dr. H. J. Barnett have completed a study of the clinical manifestations of some ninety brain stem lesions. Dr. Hyland has also reported on



cortical venous thrombosis in the puerperium, and has continued the study of the prognosis in cases of subarachnoid haemorrhage.

Dr. J. C. Richardson has completed a study of post-traumatic cerebral syndromes.

Dr. J. A. Walters and Dr. Boothroyd have continued the study of the various types of patients with disorders often referred to as fibrositis.

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- DAUPHINEE, J. A. and SINCLAIR, J. C. "Primary biliary cirrhosis" (*Canadian Medical Association Journal*, vol. 61, 1949, pp. 1-6).
- DICKSON, R. C. and ROSS, M. "Amoebiasis in veterans" (*Canadian Medical Association Journal*, vol. 61, 1949, pp. 13-18).
- DIXON, H. A. "Infantile eczema" (*Bulletin of the Academy of Medicine, Toronto*, vol. 22, 1949, pp. 232-4).
- FARQUHARSON, R. F. "Diagnosis and treatment of common chronic anemias" (*Chicago Medical Society Bulletin*, vol. 52, 1949, pp. 196-201).
- "Estado actual de la estreptomicina en el tratamiento de la tuberculosis" (*El Hospital*, vol. 5, 1949, pp. 24-5).
- "Hematology: Panel discussion" (*Proceedings of the Fifth Clinical Conference of the Chicago Medical Society*, March 4, 1949, pp. 151-2, 157-9).
- "Iron malnutrition"; in *Handbook of clinical nutrition*. New York: Paul B. Hoeber. 1950.
- "Simmonds' disease: Extreme insufficiency of the adenohipophysis"; in *American lectures in endocrinology*, no. 34. Springfield: Charles C. Thomas. 1950.
- GRAHAM, W. "Arthritis and the rheumatic diseases" (*Modern Medicine of Canada*, May, 1950).
- "Cortisone and ACTH" (*Ontario Medical Review*, vol. 16, 1949, pp. 106-7).
- "The painful shoulder"; in *Arthritis and allied conditions*, ed. B. I. Comroe. Philadelphia: Lea and Febiger. 1949.
- "Rheumatism in industry, with special reference to the factor of injury" (*Minutes of the Convention of the Association of Workmen's Compensation Boards of Canada*, Sept. 4-7, 1949).
- GREENWOOD, W. F., BARGER, A., DIPALMA, J. R., STOKES, J., III, and SMITH, L. H. "Venous pressure and cutaneous reactive hyperemia in exhausting exercise and certain other circulatory stresses" (*Journal of Applied Physiology*, vol. 2, 1949, pp. 81-96).
- GREENWOOD, W. F., BIGELOW, W. G., LINDSAY, W. K., HARRISON, R. C., and GORDON, R. A. "Oxygen transport and utilization in dogs at low body temperatures" (*American Journal of Physiology*, vol. 160, 1950, pp. 125-37).
- HAGERMAN, A. R. "Demands for service" (*Bulletin of the Academy of Medicine, Toronto*, vol. 23, 1949, pp. 30-6).
- HILLIARD, I. M. "Tests for pulmonary function" (*University of Toronto Medical Journal*, vol. 27, 1949, pp. 53-6).
- HYLAND, H. H. "Intracranial venous thrombosis in the puerperium" (*Journal of the American Medical Association*, vol. 142, 1950, pp. 707-10).
- "Periodic paralysis" (*Canadian Medical Association Journal*, vol. 61, 1949, pp. 586-8).
- "Prognosis in spontaneous subarachnoid haemorrhage" (*Archives of Neurology and Psychiatry*, vol. 63, 1950, pp. 61-78).
- PATERSON, J. F. and CRASSWELLER, P. O. "Lobectomy for bronchiectasis: Some reasons for its failure to satisfy all patients" (*Bulletin of the Academy of Medicine, Toronto*, vol. 22, 1949, pp. 223-31).
- PUGSLEY, H. E. and SPENCE, P. McK. "A case of cystic fibrosis of the pancreas associated with chronic pulmonary disease and cirrhosis of the liver" (*Annals of Internal Medicine*, vol. 30, 1949, pp. 1262-72).
- SCOTT, J. W. and DAWSON, G. D. "The recording of nerve action potentials through skin in man" (*Journal of Neurology, Neurosurgery and Psychiatry*, vol. 12, 1949, 259-67).
- SQUIRES, A. H., KOFMAN, O., and CUNNINGHAM, J. N. "Gaucher's disease" (*Canadian Medical Association Journal*, vol. 62, 1950, pp. 178-81).
- TAYLOR, R. M. and MCHENRY, E. W. "Acute thiamine deficiency: A useful diagnostic aid for its detection" (*Canadian Medical Association Journal*, vol. 61, 1949, pp. 512-18).
- "Blood pyruvate curves of normal and obese subjects following the ingestion of carbohydrate" (*Canadian Medical Association Journal*, vol. 61, Nov., 1949, pp. 518-19).
- WARWICK, O. H. "The National Cancer Institute of Canada and professional education" (*Canadian Medical Association Journal*, vol. 61, 1949, pp. 528-9).



- WATT, J. G. "The clinical applications of specific therapy" (*University of Toronto Medical Journal*, vol. 27, 1950, pp. 181-8).
- WIGHTMAN, K. J. R. "The basis of specific therapy" (*University of Toronto Medical Journal*, vol. 27, 1950, 129-33).
- WRONG, N. M. and SUMMERS, J. "Organization of a combined dermatological radiotherapeutic centre in the Canadian Army overseas" (*Bulletin of the Academy of Medicine, Toronto*, vol. 22, 1949, pp. 205-9; *Canadian Medical Association Journal*, vol. 61, 1949, pp. 30-2).
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## Obstetrics and Gynaecology

*Under the direction of Professor H. B. Van Wyck*

The end of the academic year, June 30, 1950, marks the retirement of Professor H. B. Van Wyck from the active staff of the University and the Toronto General Hospital. His successor, Dr. D. E. Cannell, takes his place as Professor and Head of the Department, as well as Obstetrician and Gynaecologist-in-Chief of that service in the Toronto General Hospital. The Department is pleased to announce the promotion of Dr. W. G. Cosbie, Dr. D. M. Low, and Dr. Lionel Armstrong to the rank of Associate Professor, and the promotion of Dr. Melville Watson to Associate.

The Department is pleased to announce the award of Fellowship in the Royal College of Surgeons of Canada by examination to Dr. Thomas Jewell, Dr. Joslyn Rogers, Dr. D. J. Van Wyck, Dr. R. H. Wesley, and Dr. L. J. Harris.

During the past year the staff of the Department, comprising the groups from each of the three teaching hospitals, has been working in increasingly closer co-operation. Three combined staff meetings were held during the year. One took place at the Toronto General Hospital, at which the following papers were read: (1) "The Present Status of Relaxin," by Dr. F. E. Bryans, who returned last year from the Department of Zoology at Harvard University under Professor Hisaw; (2) "The Anaemias in Pregnancy," by Dr. W. J. McGanity, who has returned from a year's study at Vanderbilt University under Dr. Darby; (3) "Changing Concepts in the Treatment of Placenta Praevia," by Dr. Glen Smith. Another combined meeting was held at St. Michael's Hospital, at which a comprehensive discussion of the problem of the occipito-posterior presentation was contributed by Dr. O'Leary and Dr. MacDonald. The meeting was concluded after the showing of a film on forceps rotation by Dr. Douglas Cannell. The meeting at the Toronto Western Hospital included a paper by Dr. Armstrong on "The Development of Caesarean Section"; Dr. Cannell described the present status in America of the extra-peritoneal section and Dr. Jewell reported twenty-one extra-peritoneal sections at the Toronto Western Hospital.

Among the visitors to the Department were Mr. John Blaikley of London, who lectured to the students on the psychogenic background of menorrhagia, and Professor Chassar Moir, who addressed Grand Rounds on the subject of Pelvimetry and lectured to the fourth-year students on "The Obstetrical Complications of the British Queens."

Grand Rounds have been held in the three hospitals each week throughout the year, and an effort has been made to make visitors from out of town welcome. The schedule of these rounds is available upon request at the Dean's office and it is hoped that returning graduates on their visit to Toronto will avail themselves of the open invitation to attend.

On each Monday afternoon clinical conferences have been held for the fourth-year class. These have been distributed among the three hospitals. At these conferences current cases of interest have been discussed and the students provided with a mimeographed copy of the case history and the staff comment. On Thursday afternoon at each of the hospitals students of the fourth year have read theses on



specific subjects before a group of their fellow students. These seminars have been presided over by members of the staff. It is gratifying to be able to record that the theses have been of a very high standard, and it is believed that the opportunity for formal presentation of a scientific paper such as these seminars provide is very valuable training for the students. It is also noteworthy that the majority of the students were able to illustrate their theses by lantern slides, the stock of which has been increased markedly during the past year. An effort was made to make these seminars formal in the usual well-conducted manner of a scientific session. It is hoped that visiting graduates will find it beneficial to attend these clinical conferences and seminars and take part in the discussion. Such visits of the graduates to these undergraduate sessions are very stimulating and gratifying to both staff and students.

In conjunction with other departments, an advanced refresher course in Obstetrics and Gynaecology was carried out in September, 1949 for candidates who wished concentrated postgraduate instruction preparatory to going up for examination either for Fellowship in the Royal College of Physicians and Surgeons or for certification as specialists in Obstetrics and Gynaecology. Nineteen applicants took the course and it is proposed to repeat the advanced refresher course this fall.

One of the most important functions of the Department is the providing of facilities for students who wish to qualify in Obstetrics and Gynaecology. The course that at present is available in this Department comprises two years' training as senior interne, one year as Resident, and one year as Fellow in Obstetrics and Gynaecology or one of the basic sciences. An exchange is being continued with the Department of Surgery by which our senior interne in training receives a period of training in general surgery. Posts available are naturally limited but application may be made to the Dean or the Head of the Department. Arrangements have been made to include among our senior internes a graduate who wishes special work in Obstetrics and Gynaecology with a view to general practice. This innovation should prove a valuable addition to our training facilities. Due to the co-operation of the Departments of Medicine and Surgery, some senior internes will be provided with six months in Medicine and six months in General Surgery instead of one of the years in Obstetrics and Gynaecology. This will tend to comply with the changing requirements of the Canadian Royal College.

Many conventions and meetings were addressed by members of the staff during the past year. At the 1949 meeting of the Society of Obstetricians and Gynaecologists of Canada, held at Jasper, Alta., in June, Dr. Geraldine Maloney read a paper on "The Value of Vaginal Cytology in Observing Progress under Radiation Treatment of Patients Suffering from Cancer of the Cervix"; Dr. D. E. Cannell presented a paper on "The Management of the Occiput Posterior—The Use of the Bill-Scanzoni Manoeuvre"; and Dr. M. C. Watson contributed a paper on gynaecological endocrinology. After the Jasper meeting the Canadian Gynaecological Travel Club was attended by Dr. O'Leary, Dr. Watt, Dr. Cannell, Dr. Meiklejohn, Dr. Watson, and Professor Van Wyck at meetings in Vancouver and Victoria. At Homestead, Va., in September, 1949, at the American Association of Obstetrics and Gynaecology and Abdominal Surgeons, Dr. Nelson Henderson read a paper on "Ectopic Pregnancy." At the British Congress of Obstetricians and Gynaecologists at London in August, 1949, Dr. W. G. Cosbie took part in a symposium on "Cancer of the Cervix." Dr. Van Wyck was guest speaker at the Pacific Northwest Society of Obstetricians and Gynaecologists which met in Vancouver in May, 1950. In May, 1950, at the last International and Fourth American Congress in New York, Dr. W. G. Cosbie read a paper on "The Diagnosis of Cervical Cancer" and Dr. Van Wyck took part in a symposium on the toxæmias of pregnancy. At the November meeting in Toronto of the Canadian Royal College of Obstetricians and Gynaecologists, Dr. John MacArthur read a paper on "The Treatment of Carcinoma of the Corpus Uteri."



After the New York Congress in May, 1950, the Department had the pleasure of entertaining members of the British Gynaecological Travel Club headed by Mr. Charles D. Read of London. Six wives of members accompanied the Club and a planned programme of scientific and social activities was carried out for four days.

In addition to that of the usual staff, the Department is grateful for the conscientious help received from the voluntary assistants: Dr. Magnus Spence, Dr. John Oswald, Dr. William Flatt, Dr. Herbert Tait, Dr. R. G. MacKenzie, Dr. J. C. McKellar, Dr. A. L. MacKenzie, Dr. B. E. Meek, Dr. Gordon Chambers, Dr. J. T. McCormick, Dr. Cullen Bryant, Dr. Lou Harris, Dr. Robert Kinch, and Dr. R. H. Wesley.

### RESEARCH

The Rh Committee established in November, 1946 under the chairmanship of Dr. Philip Greey with Dr. Low representing the Department, for the investigation of the Rh factor problem in the Toronto area, is still actively carrying on. Approximately 30,000 tests have now been completed and it is expected that a report of the results of the survey with the experience gained in the treatment of iso-immunized mothers, and the results from the treatment of haemolytic disease of the newborn, will be prepared in co-operation with the Department of Pathology and the Hospital for Sick Children. Under the direction of Dr. Mann, the research on the mechanism producing convulsions in eclamptic toxæmia is progressing. The work on the excretory function of the skin in eclamptic toxæmia is being continued by Dr. Mann in collaboration with Professor Dauphinee of the Department of Pathological Chemistry. To date sodium, potassium, and total nitrogen determinations on skin excretions have shown measurable amounts. The work has led to the suggestion that the electrochemical phenomena of skin potential might be an important factor in the initiation of the convulsive state. The work on this aspect and the construction of special apparatus is being done with Dr. F. E. W. Wetmore of the Electro-Chemical division of the Department of Chemistry. During the past year, Dr. Mann has carried out considerable research on the development of a self-contained portable resuscitation apparatus for the newborn infant. A completed model was placed at the disposal of the members of the staffs in Obstetrics and Anaesthesia and it is now on trial in the Private Patients Pavilion of the Toronto General Hospital. The new apparatus has been very satisfactory to date and it is hoped that in a few months the apparatus may be generally available.

Dr. Goodwin reports that in the year 1949-50 a review of 1,200 obstetrical deliveries has been made in association with Dr. H. M. S. Tait, to determine the relation of the speed of establishment of respiration in the newborn to maternal sedation during labour with varying doses of seconal, demerol, and hyoscine, and also to the type of anaesthetic administered at delivery. Dr. Goodwin has also investigated the possibility of the control of stress incontinence by the use of ischio-cavernosus muscle sling. A number of cases have been treated surgically in this way, so far with good results.

In the Pathological Department under the direction of Dr. D. N. Henderson, a review of tubal pregnancy has been completed and the result of this study is awaiting publication. Dr. Henderson is continuing the study of intra-epithelial carcinoma of the cervix. Up to the present, approximately more than five hundred cervixes have been completely sectioned and studied. Where possible the histological changes noted in the cervix are correlated with cytological changes noted in the vaginal smears. It is hoped that this study will clarify the problem of carcinoma *in situ* and establish the value of vaginal smear examinations in the detection of early unsuspected cervical carcinoma. A beginning is being made in screening all patients admitted to the Out-Patient Gynaecological Clinic by examination of the vaginal cytology.



The work begun by Dr. Maloney in the investigation of the cytological smear examination in the determination of prognosis and the reaction to therapy of tumours treated by radiation is being continued by Dr. Crawford Shier under the direction of Dr. W. G. Cosbie. The treatment and investigation of pelvic cancer have been continued by Dr. Cosbie and Dr. J. R. MacArthur, who represent the Department in the Ontario Institute of Radiotherapy. It is noted with gratification that a steroid chemistry laboratory, with Dr. Gornall in charge, has been established in the Department of Pathological Chemistry under the direction of Professor Dauphinee. This work, begun on a sound basis, is expanding rapidly. A co-operative study with the Department of Pathological Chemistry has been started to investigate the excretion of pregnanediol in habitual and threatened abortions. The Department is represented by Dr. Melville Watson, Dr. F. E. Bryans, and Dr. W. J. McGanity in this project. The co-operative study of the Department of Public Health Nutrition under Professor E. W. McHenry and our Department, represented by Dr. W. J. McGanity, has continued the investigation of protein metabolism in pregnancy. Much fundamental knowledge has been accumulated from normal and toxemic pregnancies during the past year.

On July 1, 1949, Dr. H. V. Morton, a Fellow in Anaesthesia, began to evaluate certain methods of analgesia in labour. Her research included the determination of the value of trichlorethylene in labour and the practical advantages to be obtained in the first stage of labour by paravertebral block and sympathetic block. This work was carried out under the clinical supervision of Dr. D. M. Low and Dr. H. J. Shields, Head of the Department of Anaesthesia, and a beginning was made before the end of the academic year in the trial of priscoline as an alternative to the sympathetic block. A summary of Dr. Morton's work is as yet unpublished, but in her hands, trichlorethylene has been proved a safe and useful analgesic, although there is still considerable uncertainty as to the practical value of sympathetic block.

At the Wellesley Division, Dr. Dafoe reports the continuation of his work on the electro-stethoscope in conjunction with the division of Electro-Chemistry under Professor Wetmore.

Dr. John Fletcher of the Department of Paediatrics has continued his study at the Burnside of the problems related to anoxia, atelectasis, and prematurity and has a paper reporting his work in the press.

### PUBLICATIONS

- Low, D. M. "Female infertility" (*Bulletin of the Academy of Medicine, Toronto*, vol. 22, Sept., 1949, p. 12).
- VAN WYCK, H. B. "Humanism and medicine" series (*University of Toronto Medical Journal*, vol. 27, 1948-9).
- "The influence of Christianity in medicine" (*Cap and Gown*, Dec., 1949).
- "The influence of pre-natal care in the survival and vigor of the newborn" (*Health*, Dec., 1949).
- "Recent advances in obstetrics of interest to the general practitioner" (*Canadian Medical Association Journal*, vol. 62, 1950, pp. 109-19).
- WATT, G. L. "Rupture of the uterus" (*American Journal of Obstetrics and Gynecology*, vol. 59, no. 3, March, 1950, pp. 490-6).

## Ophthalmology

*Under the direction of Professor A. J. Elliot*

The Department of Ophthalmology expanded its postgraduate training during the session 1949-50. A substantial grant for the establishment of a glaucoma clinic under the direction of Dr. T. H. Hodgson was received from the provincial government through funds provided by federal appropriation. It is planned that studies will be made on both the clinical and the laboratory aspects of glaucoma. Dr. H. L. Ormsby continued his studies in eye bacteriology and virus diseases of the



eye; he was the recipient of a special grant for this purpose from the Snyder Ophthalmic Foundation of New York, N.Y. Dr. Ormsby was awarded a Fellowship in the Royal College of Surgeons of Canada in Ophthalmology by examination in October, 1949. The Department was further strengthened by the renewal of the Canadian National Institute for the Blind Fellowship for research work in ocular genetics. These studies have been carried on during the past year by Dr. L. A. Probert of Moose Jaw, Sask., who has made an intensive survey of the hereditary manifestations of glaucoma.

Two of the postgraduate students are continuing their studies abroad. Dr. R. K. MacDonald was awarded a travelling fellowship in Ophthalmology from the Alexander Pigott Wernher Memorial Trust Fund for studies under Sir Stewart Duke-Elder at the Institute of Ophthalmology, University of London, and Dr. W. P. Callahan will continue his work under Dr. Jonas Friedenwald at the Wilmer Institute, Johns Hopkins University in Baltimore.

The senior internes delivered lectures at the Academy of Medicine, section of Ophthalmology during the academic session 1949-50: Dr. J. MacIvor reported on "The Management of Chronic Inflammation of the Orbital Socket"; Dr. R. K. MacDonald surveyed the cases of retinoblastoma in this area and Dr. H. S. Hamilton reported similarly on malignant melanomata of the choroid; Dr. J. L. Burns reviewed "Ocular Manifestations of Carotid-Cavernous Fistulae (Aneurysms)."

Drs. A. E. MacDonald, A. L. Morgan, J. C. McCulloch, J. S. Crawford, and W. P. Callahan spoke before the annual meeting of the Canadian Ophthalmological Society at Jasper. Dr. A. J. Elliot spoke before the Section of Ophthalmology of the Canadian Medical Association at Saskatoon. Dr. J. F. Aikenhead of Calgary, Alta., a junior interne, reported his studies on "The Relative Ratings of Local Anaesthetics for Small Nerve Blocks" at the Association for Research in Ophthalmology, east-central section, in Cleveland, Ohio. Dr. A. J. Elliot and Dr. J. L. Burns spoke before the Buffalo Ophthalmological Club.

A combined refresher course in Ophthalmology and Oto-Laryngology was held for a week in January. The guest speakers in Ophthalmology were Dr. Peter Kronfeld of Chicago, Ill., and Dr. J. A. MacMillan of Montreal, Que. Dr. Kronfeld held a surgical clinic in the operating rooms of Sunnybrook Hospital on glaucoma and delivered several excellent lectures on the same subject. Dr. J. A. MacMillan discussed the diseases of the lacrimal apparatus.

The Hospital for Sick Children building programme is well advanced and a very modern eye department is planned. Plans were further advanced during the past year regarding the proposed university eye institute. The Department will gratefully receive funds and bequests toward the endowment of research in the proposed eye hospital.

The Department acknowledges with gratitude the co-operation of the other departments within the University and the facilities afforded the fellows seconded to them for research work. This work has been actively co-ordinated under the direction of Drs. J. C. McCulloch and H. L. Ormsby.

The Department was the recipient of an ophthalmoscope from the J. F. Hartz Co., Ltd. which was awarded to Mr. L. P. Laing of Windsor, Ont., for having attained the highest grade in clinical ophthalmology for the third medical year.

## RESEARCH

Dr. R. W. Robertson has been working in the Department of Medical Research under Dr. Best. He has been under the immediate direction of Dr. George Clowes. He has been studying systems to by-pass the left ventricle, to allow exposure of the mitral valve; also he has taken part in studies of the lysozyme content of the large bowel as related to ulcerative colitis.



Dr. C. D. Baird has been working in the Department of Anatomy under the immediate direction of Dr. C. G. Smith. He has been studying the survival time of retinal cells when deprived of blood supply by increased intra-ocular pressure.

Dr. D. Black has been working under Dr. P. H. Greey in the division of Bacteriology. He has done the routine eye cultures and cytology, continued the passage of toxoplasma, and has been studying the characteristics of the human lens as a culture medium.

Dr. L. A. Probert has been working in the Department of Zoology, sub-department of Genetics, under Dr. L. Butler. He has been investigating the hereditary aspects of glaucoma, and also doing a genetic study of a piebald strain of mice.

#### PUBLICATIONS

- BAIRD, R. P. "Uveoparotitis" (*Bulletin of the Academy of Medicine, Toronto*, vol. 23, 1950, p. 66).
- BURNS, J. L. and HARTROFT, W. S. "Intraocular hemorrhages in young rats on choline-deficient diets" (*American Journal of Ophthalmology*, vol. 32, June, 1949, pp. 79-91).
- CRAWFORD, J. S. "The present status of orbital implants" (*Transactions of the Canadian Ophthalmological Society*, 1949, p. 94).
- ELLIOT, A. J. "The differential diagnosis of important lesions of the optic disc" (*Ontario Medical Review*, vol. 16, 1949, p. 75).
- KYLE, J. L. "Ocular findings in congenital heart disease" (*Canadian Medical Association Journal*, vol. 62, March, 1950, p. 263).
- MACDONALD, A. E. "Lacrimal gland tumours" (*Transactions of the Canadian Ophthalmological Society*, 1949, p. 45).
- MACDONALD, R. K. "Effects of testicular extract on certain ocular structures" (*American Journal of Ophthalmology*, vol. 32, 1949, p. 96).
- MACIVOR, J. "Allergy to artificial plastic eyes" (*Canadian Medical Association Journal*, vol. 62, Feb., 1950, p. 164).
- MCCULLOCH, J. C. and CALLAHAN, W. "Clinical application of the principles of tonometry" (*Transactions of the Canadian Ophthalmological Society*, 1949, p. 72).
- MORGAN, A. L. "Problems in the treatment of strabismus" (*Transactions of the Canadian Ophthalmological Society*, 1949, p. 22).

### Oto-Laryngology

*Under the direction of Professor P. E. Ireland*

During the session of 1949-50 two new appointments were made to the staff of this Department: Dr. D. P. Bryce to the Toronto General Hospital and Dr. W. Wallace to the Hospital for Sick Children. It is the proposed policy of the Department that no new appointments will be made except to those whose training is considered adequate enough for them to be placed at the fellowship level. This was the first year a Fellowship examination by the Royal College of Surgeons was established in Oto-Laryngology. The two new appointees to our staff were the only candidates and were both successful. Several other young specialists will soon be eligible for these examinations.

Dr. Douglas Bell has completed fifteen months of study in England and Europe and is now spending an additional year in Bronchoscopy and Laryngology as resident for Dr. Louis Clerf in Jefferson Medical School in Philadelphia. Dr. Blair W. Fearon is resident in Broncho-Oesophagology with Dr. Gabrielle Tucker at the University of Pennsylvania, Philadelphia. Dr. Page Statten has recently returned after three years with Dr. Samuel Crowe at Johns Hopkins Medical School, Baltimore.

The postgraduate training has been divided into three divisions. The first of these is the two-year scheduled course of clinical and basic science instruction which requires registration with the University for postgraduate work. The course consists of a clinical internship with rotation through the University teaching hospitals and Sunnybrook. There are, in addition to this, didactic and basic science lectures



and also laboratory studies. This schedule has been approved by the Royal College of Surgeons and the American College of Surgeons as acceptable for certification in the specialty. It provides specialists to the non-teaching centres. The second division is designed with more latitude to give added basic science training, additional time in Medicine or Surgery, and periods of study in other centres in the United States or abroad. This course is conducted by the use of the fellowships which are available, and individual planning with other centres. It is designed to produce men for our teaching centres both here and elsewhere in Canada with the ultimate goal the Fellowship in the Royal College of Surgeons. The third division is to present refresher training yearly to specialists across Canada who have not previously had the opportunity of obtaining this type of work in our own country. This complete programme has required four years to become fully established but is now functioning satisfactorily in all of the three branches.

The combined refresher course in which our Department was associated for the third year with the Department of Ophthalmology was held in January and was again filled to capacity. This year Dr. Gabrielle Tucker of the University of Pennsylvania, Philadelphia and Dr. W. T. McNally of McGill University were the guest speakers. The registration was from Newfoundland to New Westminster and there does seem to be an appreciation of the effort to establish a Canadian centre for this type of postgraduate study.

The undergraduate training continues on the same basis with an attempt to consolidate the final-year teaching by the use of mimeographed outlines. It is still regretted that the crowded schedule of the final year limits the teaching of our specialty, but this seems necessary. An attempt has been made to increase the practical, clinical value of the third-year teaching.

The acoustic laboratory established by the Royal Canadian Air Force under Dr. J. A. Sullivan in the Physics Building still continues to function with the able assistance of Mr. W. E. Hodges. This project is still working in close co-operation with the Air Force Medical School and the Department of Veterans Affairs rehabilitation programme at Sunnybrook Hospital. Many distinguished visitors have visited this project during the past year.

The Hospital for Sick Children is preparing an excellent programme for the deaf child in the new hospital which will soon be opened. Under Dr. D. E. S. Wishart an adequate scheme for the testing of hearing has been elaborated, with suitable improved apparatus made within the Hospital for use in the Dix-Hallpike technique.

Building plans for a sound-proof room and the utilization of the André Dorfman bequest to the Toronto General Hospital are awaiting general decisions as to new construction within the Hospital.

Professor P. E. Ireland and Dr. J. A. Sullivan attended the International Congress of Otolaryngology in London, England, in July. Professor Ireland was the Canadian representative to the International Committee and Dr. Sullivan was a guest speaker, on the subject "Ten Years' Experience with the Fenestration Operation." This was the first International Congress since 1938 and was attended by representatives of thirty-eight countries.

Professor P. E. Ireland and Dr. J. A. Sullivan were guest lecturers at the Research Study Club, Los Angeles, Calif., in January last. They presented fifteen lectures to approximately four hundred members of this organization.

Professor P. E. Ireland was one of the guest lecturers at the summer school of the British Columbia Medical Association in 1949 and the University of Minnesota postgraduate course in Oto-Laryngology in June, 1950.

Dr. H. W. D. McCart has continued his studies and operative procedures on carcinoma of the larynx and upper respiratory tract. He is still the representative of this Department at the Institute of Radiotherapy.



## RESEARCH

Dr. Brydon Smith has continued his research on degeneration of bone under the combined direction of Dr. J. A. Sullivan and Professor A. W. Ham in the Department of Anatomy. This was presented by Dr. Sullivan at the International Congress in London, England. In this programme have also been included experimental studies in the artificial production of peripheral seventh nerve paralysis. The results were presented by Dr. Sullivan at the American Otological Society in San Francisco in May.

Dr. Eric Stark, in conjunction with Professor J. K. Ferguson, has conducted studies on the toxic properties of cocaine and pontocaine in the upper and lower respiratory tract.

Dr. D. E. S. Wishart has continued his studies of methods of examining hearing in children and the treatment of sinusitis in bronchiectatic children.

Dr. J. B. Whaley has been associated with Dr. Gladys Boyd of the Department of Paediatrics in a study of the bronchial and lung changes in tuberculosis in children. Dr. W. B. Wallace is beginning a programme of investigation of sinus disease in children.

Dr. H. W. D. McCart has continued his study of the surgical and radiological treatment of malignancies of the sinuses, nasopharynx, and larynx.

Dr. D. P. Bryce is making a clinical study of anoxemia during bronchoscopy with the assistance of the Department of Pharmacology under Professor J. K. Ferguson.

Dr. G. A. Fee is studying the effect of hearing aids on cases of deafness with a large perceptive element. He is also endeavouring to evaluate the use of plastic inserts as an aid to hearing in conductive deafness which is due to damage to the drum membrane.

## PUBLICATIONS

- BURNHAM, H. H. "The anterior ethmoidal nerve syndrome" (*Archives of Otolaryngology*, vol. 54, Nov., 1949, p. 640).
- IRELAND, P. E. "Nasal discharge, nasal obstruction and sinusitis" (*Bulletin of the Vancouver Medical Association*, vol. 25, no. 10, July, 1949, p. 211).
- "Otological findings in acoustic nerve tumors" (*Annals of Otology, Rhinology and Laryngology*, vol. 58, no. 3, Sept., 1949, p. 716).
- "Symptoms and treatment of hoarseness" (*Bulletin of the Vancouver Medical Association*, vol. 26, no. 2, Nov., 1949, p. 51).
- "Vertigo of aural origin" (*Bulletin of the Vancouver Medical Association*, vol. 25, no. 11, Aug., 1949, p. 238).
- MCCART, H. W. D. "Adenoma of the trachea" (*Annals of Otology, Rhinology and Laryngology*, vol. 58, no. 4, Dec., 1949, p. 1217).
- "Anaesthesia in peroral endoscopy" (*Bulletin of the Academy of Medicine, Toronto*, vol. 22, no. 6, March, 1949, p. 124).
- WISHART, D. E. S. "Rhinology in children: Resumé of and comments on the literature for 1948" (*Laryngoscope*, vol. 59, no. 9, 1949, p. 929).

## Paediatrics

*Under the direction of Professor Alan Brown*

Our teaching plan has continued to function in the same manner since the reorganization with the Department of Obstetrics three years ago, and so far is proving to be a satisfactory arrangement. However, the large number of students in the final year do not have the close contact with the individual patients that we desire, or that is really necessary for adequate training to meet paediatric problems that arise in **general practice**. We are still very strongly of the opinion that more hours should be allocated to Paediatrics; as stated in the report of 1949, a survey of the Medical Schools of the United States and Canada revealed that more hours of paediatric teaching are necessary as fully 75 per cent of the children of our



country are still looked after by general practitioners. The main object of our undergraduate teaching still remains the same, namely, to sufficiently acquaint the students with the problems that they will meet most commonly in private practice.

During the past year we have had 15 different postgraduate students from various countries, including Hungary, India, Latvia, China, England, and the occasional one from Canada.

It is of interest to observe that ninety-one addresses of both a scientific and a public nature have been given by members of the Department of Paediatrics. The great majority of these addresses were to lay audiences acquainting them especially with the methods of prevention of disease in infancy and childhood. This is further evidence of the usefulness of the Children's Hospital in disseminating knowledge to the public at large concerning the care of children. During the same period seven scientific articles have been published and nine research problems have been under investigation, as will be observed in the more detailed report.

We are pleased to be able to record the fact that we are now in closer co-operation with the General Hospital clinics, as we have conjoint rounds in diabetes, endocrine and chest work, which should be of mutual benefit to both Institutions.

Dr. Bernard Laski obtained the degree of F.R.C.P.(C).

It is our earnest hope that most of the teaching in 1950-1 will be conducted in the new hospital on University Avenue.

### RESEARCH

In co-operation with the Connaught Medical Research Laboratories, Dr. Nelles Silverthorne, Dr. M. P. Armstrong, and Dr. A. M. Goodfellow have continued clinical and epidemiological studies on poliomyelitis in Dufferin County. Pathways of infection were traced from one patient to another, the minor illness or abortive form of the disease playing a major role in its widespread dissemination. Thirty of the thirty-nine cases investigated were of this variety. The recently described Cocksackie virus was isolated for the first time in Canada from a number of our study patients, some of whom also excreted the virus of poliomyelitis. The study is continuing throughout the winter months in order to survey the inter-epidemic nature of the disease.

Dr. C. S. Anglin, in co-operation with Dr. W. Mustard, has evaluated the use of priscoline in the relief of pain, tenderness, and muscle spasm in acute poliomyelitis. In both priscoline-treated and control groups the general tendency was to improvement but it was not more dramatic in the priscoline group than in the controls. Thirty poliomyelitis patients who were not treated with priscoline were re-examined at an average of thirty-five days from date of onset of the infection, and in only one of these patients was there any evidence of residual pain, tenderness, or muscle spasm.

A follow-up study of the recovered acute bacterial meningitis cases admitted to the Hospital for Sick Children in the past ten years is in progress by Drs. Silverthorne and Anglin to determine the incidence and types of sequelae. Complete physical examination and, in special cases, intelligence tests and investigation of hearing and vestibular dysfunction are included in the examination. To date, 159 survivors have been rechecked and 72.3 per cent showed no sequelae, 21.4 per cent showed minor non-incapacitating and 6.3 per cent showed severe incapacitating sequelae.

The study on the development of arteriosclerosis by Dr. A. L. Chute has been continued and amplified. His research work, in collaboration with Dr. W. Mustard, on devising a method for cardiac surgery has progressed and they now have seven animals which have survived the various types of intracardiac operations for indefinite periods of time. Further work is being done in this field with the hope of making it applicable clinically.



In association with Dr. Albert M. Fisher of the Connaught Laboratories, tests of a hyperglycaemic factor isolated from pancreas have been made in cases of glycogen disease. The results from this work have been negative in character, since there was no apparent increase in blood sugar values following its administration.

Dr. Chute has made a survey of the incidence of diabetes in the town of Newmarket, with a population of about 4,800 people; 4,400 of these people have had a urine and blood examination which revealed that there were 30 diabetics who were previously known and 20 diabetics who were discovered by this survey. It is hoped that the survey will be continued to include other population groups such as a northern Ontario mining town and one of the French-Canadian centres in the eastern part of the province. Diabetes is not a reportable disease, and it is hoped that by such a survey we shall get a true picture of the importance of this condition. With the co-operation of the Ontario College of Education and the Faculty of Dentistry of the University, Dr. Elizabeth Chant Robertson, Dr. S. H. Jackson, and Dr. T. G. H. Drake have made continuous observations on the mental and physical health and development, absenteeism, and physical fitness of approximately two hundred lower school children who, for a period of slightly over two school years, had been given a noon lunch of good nutritional value. The effect of the school lunch on the food consumed in the home by these children and their families has also been studied. Similar observations have also been carried out on a carefully matched control group. The data are now being collected for publication.

Dr. John D. Keith has studied the post mortem and clinical material in congenital heart disease. Data were collected on the following malformations: ventricular septal defect, atrioventricularis communis, Eisenmenger's complex, coarctation of the aorta, auricular septal defect, patent ductus arteriosus, tetralogy of Fallot, tricuspid atresia, transposition of the great vessels, pure pulmonary stenosis, pulmonary stenosis with patent foramen ovale, persistent truncus arteriosus. The material, together with a discussion of the methods of investigation, operative procedures, results, and prognosis, was set down in a paper that will appear in print shortly. In co-operation with Dr. John Munn, an apparatus for use in angiocardiology has been devised which will take serial X-rays at the rate of four per second. A paper describing the apparatus together with its application in the diagnosis of a wide variety of defects in congenital heart disease, cyanotic and non-cyanotic, has been submitted for publication.

Further studies in angiocardiology in congenital heart disease were carried on in certain specific abnormalities; these are being reported separately.

In co-operation with the Department of Health of the City of Toronto, an investigation into the prevalence of all types of heart disease in children, as well as of functional or incidental heart murmurs, was carried out by Drs. J. D. Gardiner and J. D. Keith.

A study of the diagnosis of auricular septal defects by means of an intracardiac catheter has been in progress for the past year and has been completed.

Dr. J. P. Fletcher has continued his work on the newborn infant. Apparatus employing oxygen at very low pressure has been perfected for use in resuscitation of the newborn; this obviates the danger of the high pressure systems at present incorporated in most commercially produced machines. A report on a three-year study on resuscitation of the newborn has been prepared for publication.

Further study of the effects of damage to the nervous system at birth and in early infancy has been made. Infants admitted to the infant ward with such damage have been followed both during their hospital stay and subsequently in the Neurological Out-Patients Department. This work will require several years before final conclusions can be drawn.

The walking reflex of the newborn infant has been studied further. It is a useful indication of intactness of the nervous system at birth but does not seem to possess any special significance.



Clinical studies in the Allergy Clinic by Dr. J. R. Ross and Dr. H. E. Edwards have confirmed the previously reported observation that, in the treatment of hay fever and asthma, slowly absorbed solutions of the appropriate antigen are greatly superior to aqueous solutions. A higher final dosage of the antigen may be achieved and fewer treatments are necessary to reach this amount. Polyvinyl alcohol is the substance used to delay the absorption.

The psychological factors associated with the treatment of the diabetic child are being surveyed and the effect of correction of these factors upon therapy is being evaluated by Drs. W. A. Hawke and Mary Eddis. At the Country Branch the psychological principles associated with the care of the convalescent child are being studied. The problems encountered in the home with the cerebral palsied child and the manner in which these specific problems affect the results of treatment are being investigated by Dr. T. G. Hall. In co-operation with the York County Children's Aid Society the relationship of a psychiatrist to a children's agency is being observed by Dr. S. J. Holmes.

An exhaustive study of tuberculosis in children is being carried out by Dr. Gladys Boyd. This work includes clinical research on the effect of such drugs as streptomycin, paramino-sulphacylic acid, and the sulphones in various types of tuberculosis, and laboratory determinations of the effect of these drugs on the infecting organisms. Thorough bronchoscopic studies are also being carried out on tuberculous children to determine the pathology of the disease on the bronchial tree and the effect of therapy on such lesions when present. Clinical studies including follow-up reviews of cases of pleural effusion and erythema nodosum have been made by Dr. Miriam Brick and Dr. Isabel Booth. Continuous studies are being made of bronchiectasis. The effect of aureomycin in these cases is under investigation. Sequestration of the lungs is being given special consideration.

In collaboration with Dr. Donohue of the Department of Pathology of the Hospital for Sick Children, Dr. C. E. Snelling has continued the studies on the use of an antifolic acid compound in the treatment of leukaemias. No marked success has been achieved, though in about 20 per cent of cases a remission of varying periods was brought about. The results suggest that some similar compound may be of definite lasting benefit. Recently, in association with the Hospital Department of Pathology and the University Department of Medicine, the use of ACTH in leukaemia treatment has been studied. It is too early to draw any conclusions, but the results so far suggest even better effects than with the antifolic acid compounds.

The value of replacement transfusion with the use of female Rh negative blood in the treatment of erythroblastosis is being observed.

Dr. J. H. Ebbs and Dr. A. Sass-Kortsak are studying the effect of severe infections and toxic states upon the changes in the liver in young infants. Attempts are being made to relate the conditions found in the liver to the various etiological agents and to the previous diet. Attempts are also being made to assess different methods of treatment. The possible use of lipotropic preparations is also being investigated.

Work on malnutrition due to defective digestion and absorption is being continued by Dr. J. F. McCreary and Dr. Vivian Abbott. It is felt that the diagnosis has progressed as far as is possible with the available knowledge of this disease. Accordingly investigations are under way in an attempt to determine the cause of the condition. Various hypotheses are being studied. It is hoped that these will lead eventually to a means of prevention.

Dr. Andrew Hunter has made an intensive study of the factors affecting the Knoop reaction for histidine. Means have been found of increasing considerably the delicacy of this reaction. At the same time there has been developed a colorimetric method of histidine determination not only more sensitive but also more convenient than any previous one. Studies of applications of this method are in progress.



Dr. S. H. Jackson has continued his biochemical work. Studies have shown that the retention of fluorine when fed as bone is equal to that of soluble fluoride unless the fluoride content of the material is low as is the case in veal bone. Further observations on the cumulative effect of long-term fluorine feeding are in progress.

The biological value of the protein of cooked bone has been found to be so low that it cannot serve as a source of protein for body repair even when supplemented with nine parts of animal protein to one of bone protein.

Studies of vitamin A in liver have failed to indicate any mobilization of this vitamin in the fatty livers of choline-deficient rats.

Studies of intestinal phosphatase in rats have indicated that the concentration of this enzyme in the intestinal mucosa is more than doubled during active absorption of a wide variety of foods. Variation in intestinal phosphatase during fasting and digestion is reflected in the blood serum phosphatase. Treatment with ACTH, which is known to stimulate the rate of intestinal absorption, was found to have no effect on the concentration of phosphatase either in the serum or in the intestinal mucosa.

Various biochemical metabolic studies are being undertaken coincidental with the investigations involving treatment with ACTH and cortisone.

A practical book on nutrition for the use of public health nurses, social workers, and homemakers is being prepared by Dr. Elizabeth Chant Robertson.

#### PUBLICATIONS

ARMSTRONG, Miss M. P., SILVERTHORNE, N., *et al.* "Studies on poliomyelitis in Ontario. II. Isolation of the Coxsackie virus in association with poliomyelitis virus" (*Canadian Journal of Public Health*, vol. 41, Feb., 1950, pp. 51-9).

EDWARDS, H. E. "Aspects of perennial allergic rhinitis and asthma in childhood" (*Canadian Medical Association Journal*, vol. 61, 1949, pp. 36-8).

JACKSON, S. H., TISDALL, F. F., DRAKE, T. G. H., and WIGHTMAN, Miss D. "Retention of fluorine when fed as bone and as sodium fluoride" (*Journal of Nutrition*, vol. 40, April, 1950, pp. 515-35).

JOLLIFFE, N., TISDALL, F. F., and CANNON, P. R. (eds.). *Clinical nutrition*. New York: Paul B. Hoeber. 1950.

ROBERTSON, Mrs. E. C. and MUELLER, G. W. *Fundamentals of health and safety*. New York: Van Nostrand.

SILVERTHORNE, N. *et al.* "Studies on poliomyelitis in Ontario. I. Observations on the apparent infectiousness of the acute case" (*Canadian Medical Association Journal*, vol. 61, Sept., 1949, pp. 241-50).

SNELLING, C. E. *et al.* "Pituitary adrenocorticotrophic hormone (ACTH) therapy in eosinophilic leukemia: A preliminary report" (*Journal of the American Medical Association*, vol. 143, no. 2, 1950, pp. 154-7).

### Pathological Chemistry

*Under the direction of Professor James A. Dauphinee*

Professor Gornall, who was on leave of absence and studying abroad on the occasion of the last report, has returned to the Department, and since his return he has, in addition to his numerous other duties, taken charge of the new Steroid Hormone Laboratory which was established last year with the help of a grant from the Department of Public Health. Mr. H. W. Willoughby, M.A., has been appointed to the position of Research Assistant in this Laboratory and Miss Pamela Walker and Miss Dora Strachan have also joined it as members of the technical staff. The work that is being carried on by Dr. Gornall and his group in this important branch of clinically applied chemistry (which is now largely financed by the help of a grant-in-aid from the National Research Council and which will be reported more fully below) is filling a very definite need and it will, it is hoped, contribute greatly to the advance of our knowledge and understanding of the many endocrine and hormonal problems which are met with in the fields of medicine, surgery, obstetrics and gynaecology.



Dr. S. H. Jackson, Head of the Biochemical Laboratory at the Hospital for Sick Children, has become attached to this staff with the rank of Associate. Dr. Jackson is a very valuable addition to our group because of his broad knowledge of clinical chemistry and particularly because of his work in the field of nutrition and vitamin assays.

Dr. W. Paul has been placed in charge of the work in the Radioactive Isotopes Laboratory, which has also been set up with the help of a grant obtained from the Department of Public Health and is now largely financed by a grant-in-aid provided by the Ontario Cancer Treatment and Research Foundation. Miss Amy Britton, M.Sc., is also working in this Laboratory as his Research Assistant. This Laboratory has been established for the purpose of receiving, handling, distributing, and assaying radioactive materials including the isotopes which are received from the Atomic Energy Project of the National Research Council to be used in the investigation and treatment of patients in the various University of Toronto teaching hospitals. It also carries out all the necessary analyses on specimens obtained from these patients, and of course works in close conjunction with the hospital clinicians and with the University of Toronto Committee on the Clinical Use of Isotopes.

The fellows who have been engaged in teaching and research in the Department during the past year include Dr. Dorothy Ley, who holds a National Research Fellowship for Medical Research, D. Michael Kovalik, Mr. Ian Walker, and Dr. J. F. R. Fleming. Dr. Fleming has spent the past year in this Department as part of his general training in the Department of Surgery. Dr. W. B. McClintock, who has been working with Dr. Tovee of the Department of Surgery, has also spent part of his time working in this Department.

One hundred and seventy-one students of the second medical year and 176 students of the third medical year have been registered in the Department, and in addition facilities have been provided for students of the third medical year for the carrying out of urine analyses on the patients whom they are studying in the hospital and for the examination of other urine specimens of particular medical interest. The policy initiated last year of having one of the members of the Toronto General staff (in this instance Dr. Paul O'Sullivan) appointed as a part-time Demonstrator in this Department to help in obtaining interesting and important specimens from patients in hospital for student examination has again been adopted and found to be satisfactory. Mr. M. O. O'Sullivan at St. Michael's Hospital and Mr. J. S. Wilson at the Western Hospital have supervised the student instruction in this regard at their respective institutions.

Among the graduate students working in the Department, two are registered for the B.Sc.(Med.) degree and two for the M.A.; two others are taking a Ph.D. minor in Pathological Chemistry.

A short and intensive course in laboratory methods and techniques of measurement used in Clinical Chemistry has been provided in August and September under the direction of Professor Nicholson for the benefit of incoming fellows and graduate students. This has been designed particularly for those medical graduates who plan to work in the laboratory but who have not done any laboratory work since they took their work in this or in similar departments during the time of their undergraduate training.

A series of seminars on topics in the field of Pathological Chemistry has been conducted during the course of the year for the benefit of staff, graduate students, and anyone else who has been interested.

Members of the staff have taken part in the advanced graduate course given by the Faculty of Medicine during September and October and in the postgraduate courses put on by the Ontario Medical Association, and have at times contributed to the programmes of staff meetings of other departments.



## RESEARCH

Dr. Sinclair, of the Department of Medicine, has continued to work in close co-operation with this Department in the clinical investigation and follow-up of patients with a variety of liver diseases. In addition to liver function studies, carried out with the assistance of Miss Peppiatt, an attempt has been made to investigate more fully the effect of low salt diets and mercurial diuretics on the oedema and ascites of cirrhotic patients and some very interesting states of marked hyponatremia without the usual manifestations usually associated with low blood sodium levels have been observed. The following two papers were given at the annual meeting of the Canadian Medical Association in June, 1949 as a part of these studies: "The Diagnosis of Liver Disease," by J. A. Dauphinee; "The Treatment of Liver Disease," by Jonathan C. Sinclair.

Dr. R. D. Hawkins of the Banting and Best Department of Medical Research has made a series of observations on the plasma pseudo-cholinesterase content of the blood of many of these patients with liver disease and has shown that there is a close association between the level of this enzyme in the blood and the clinical state of the liver.

Mr. C. E. Downs has studied in detail the analytical possibilities of the flame photometer. He has shown that although this instrument gives satisfactory (and very rapid) answers for potassium and sodium in serum a number of changes in procedure have to be introduced if this instrument is to be used for the analyses of fluids which contain a large amount of potassium and a very small amount of sodium.

This Department has co-operated with Professor Kerr and Dr. George Low of the Department of Therapeutics in their study of patients suffering from diabetic coma, acute uraemia, and familial periodic paralysis, and, with the help of Miss Constance McLeod and Mr. C. E. Downs, a very complete examination of the electrolyte and other changes which take place in these patients has been made.

Some preliminary studies have also been begun in co-operation with Dr. John Mann of the Department of Obstetrics and Gynaecology on the influence of hot baths on the excretion of sodium, potassium, chloride, and of non-protein nitrogenous compounds through the skin.

Mr. Ian Walker has developed a markedly improved modification of the Sakaguchi reaction for the determination of arginine and glycocyamine and has been attempting to separate these two compounds by various absorptive techniques.

Dr. Dorothy Ley has been estimating the iron content, fat content, and soluble protein content of the livers of patients who have died from cirrhosis and other forms of hepatic disease in an attempt to find out whether or not there is any relationship, particularly in regard to the iron content, between the type of cirrhosis encountered here and those which have been described by the Gillmans of South Africa.

Dr. J. F. R. Fleming who has been working in this Department as part of his graduate training in Surgery has been associated with the work which Dr. Bigelow of the Department of Surgery has been carrying out on animals with induced hypothermia. He has made a very interesting study of the acid base changes which occur in cooled animals and has shown that they develop, unless prevented by special procedures, a very severe degree of gaseous acidosis indicated by a definite fall in the blood pH and a sharp rise in the  $P_{CO_2}$ .

In addition to these studies several series of observations have been made on the effect which has been produced by cortisone and ACTH on the blood and urine electrolytes of a variety of patients in the Toronto General and Sunnybrook Hospitals who have been receiving this form of therapy.

In the Radioactive Isotopes Laboratory, Dr. W. Paul and Miss Britton have worked in close association with Dr. M. W. Johnston of the Department of Medicine and the other members of the clinical sub-committee in their studies on the use of radioactive iodine in the diagnosis and treatment of the various forms of thyroid



disease including carcinoma of the thyroid and certain cases of hyperthyroidism. They have also co-operated closely with Dr. K. J. R. Wightman and Dr. C. J. Bardawill of the Department of Medicine in their investigations into the uses of radioactive phosphorus.

*Under the direction of Professor T. F. Nicholson*

Dr. M. Kovalik and Dr. T. F. Nicholson have been engaged in an investigation to determine the diet which, in dogs, will result in the minimum rate of protein catabolism. This work is preliminary study in the experimental investigation of the relative value of dietary treatment and the artificial kidney in acute uraemia.

Dr. Nicholson has continued the study of renal function as affected by unilateral kidney lesions. It has been found that minimal damage to the proximal tubules, which does not affect the kidney's ability to excrete para-aminohippuric acid or diodrast and which does not change the tubular permeability in respect to inulin or urea, results in a decrease in the urinary titratable acidity and phosphate and an increase in the amount of ammonia produced.

*Under the direction of Professor A. G. Gornall*

An extensive programme of research has been initiated in the new Steroid Hormone Research Laboratory during the past year.

Assay procedures for the 17-ketosteroids, corticosteroids, and pregnanediol have been set up and tested experimentally. Mr. Willoughby has improved the colorimetric method of determining pregnanediol and is investigating the "formaldehydogenic" steroids which can be removed from chloroform extracts of urine by different solvents. Miss M. P. Walker is studying the losses that may occur at different stages in the pregnanediol methods.

Encouraging progress has been made in a number of clinical investigations. Several endocrinological cases of special interest have been studied and four major research projects are in progress with the following clinical collaborators: (1) with Dr. J. A. Dauphinee and Dr. J. C. Sinclair of the Department of Medicine, "Metabolism and excretion of steroid hormones in cirrhosis and other liver diseases"; (2) with Dr. M. Ogryzlo, Dr. Almon Fletcher, Dr. Wallace Graham and others of the Department of Medicine, "Excretion of steroid hormones during ACTH and cortisone therapy"; (3) with Dr. R. Gjessing and Dr. L. Gjessing of the Department of Psychiatry, "Activity of the adrenal cortex in periodic catatonia"; (4) with Drs. F. E. Bryans and W. J. McGanity of the Department of Obstetrics and Gynaecology, "Excretion of pregnanediol in relation to the problem of threatened abortion."

Dr. Gornall has also resumed charge of the Clinical Investigation Laboratory which is now working in close correlation with the Steroid Laboratory on a number of problems. Three projects have continued from last year. Mrs. H. Wallace has carried out the dye determinations in a study of blood volume in chronic shock (with Drs. W. C. Bigelow and R. Fleming of the Department of Surgery) and has performed the pyruvic acid analyses in a study of carbohydrate metabolism in diabetics (with Dr. R. M. Taylor of the Department of Medicine). She has also continued the multifractionation studies of the serum globulins in patients with various diseases.

Special emphasis has been given this year to the study of nitrogen metabolism in different diseases, particularly in relation to endocrinological factors. Three problems are being studied with the following collaborators: (1) with Dr. M. Ogryzlo, Dr. A. Fletcher, and Dr. Wallace Graham of the Department of Medicine, "Nitrogen metabolism in rheumatoid arthritis during therapy with ACTH and cortisone"; (2) with Dr. K. J. R. Wightman and Dr. C. J. Bardawill of the Department of Medicine, "Nitrogen metabolism in leukaemia during therapy with urethane, ACTH, and cortisone"; (3) with Dr. R. Gjessing and Dr. L. Gjessing of the Depart-



ment of Psychiatry, "Nitrogen excretion during the different phases of periodic catatonia."

Dr. Gornall has also been studying in collaboration with Dr. Clowes, Department of Surgery, and Dr. O'Sullivan, Department of Medicine, the lysozyme content of the feces in ulcerative colitis.

### PUBLICATIONS

- BARDAWILL, C. J. and GORNALL, A. G. "The influence of dietary protein levels on experimental liver injury in dogs" (*Biochemical Journal*, vol. 45, 1949, p. 111).
- BIGELOW, W. G., LINDSAY, W. K., HARRISON, R. C., GORDON, R. A., and GREENWOOD, W. F. "Studies in hypothermia. I. Oxygen transport and utilization in dogs at low body temperatures" (*American Journal of Physiology*, vol. 160, 1950, pp. 125-37).
- DAUPHINEE, J. A. "Sodium, potassium, and chloride malnutrition, including water balance and shock"; in *Clinical nutrition*, ed. N. Jolliffe, F. F. Tisdall, and P. R. Cannon, pp. 328-73. New York: Paul B. Hoeber. 1950.
- DAUPHINEE, J. A. and SINCLAIR, J. C. "Primary biliary cirrhosis" (*Canadian Medical Association Journal*, vol. 61, 1949, pp. 1-6).
- NICHOLSON, T. F. "Renal function as affected by experimental unilateral kidney lesions. II. The effect of cyanide" (*Biochemical Journal*, vol. 45, 1949, pp. 112-15).

## Pathology and Bacteriology

*Under the direction of Professor William Boyd*

The smooth and happy working of any mechanism, organization, or family does not make news. So it is with a department. But there are promotions and resignations.

Dr. H. J. Barrie has been made an Associate Professor, a promotion well justified by his ability as a teacher and a research worker.

Dr. E. A. Linell has been signally honoured by being elected President of the Academy of Medicine for 1950-1.

Dr. W. L. Robinson has resigned his position as Professor of Pathology, after being associated with the department for thirty-five years. It is difficult to speak in sufficiently high terms of the service which Dr. Robinson has rendered to the Department during this period, both as a teacher of the principles of general pathology, and as an instructor and inspirer of young pathologists and embryo surgeons in the difficult art and science of surgical pathology.

In addition to the usual teaching fellows the following have worked in the Department in a voluntary capacity: Dr. A. Bogoch (one year); Dr. C. G. Cameron, Dr. R. R. Francis, Dr. Jamil Karsh, and Dr. J. S. Simpson (six months each); Dr. R. G. S. Arthurs and Dr. E. B. Cahoon (six months each on Neuropathology). Dr. T. H. Chiang from China has been an observer for the past nine months. The Hermant Fellow in Ophthalmology in the division of Bacteriology has been Dr. Davidson Black.

The clinical-pathological conferences arranged for the benefit of the departments of Medicine, Surgery, and Obstetrics and Gynaecology form a feature of postgraduate instruction of marked value to all who take part in them. The same is true of the conferences on bone pathology arranged by Dr. W. L. Robinson and Dr. R. I. Harris, and those of Dr. E. A. Linell on neuropathology for physicians and surgeons interested in neurology and for psychiatrists.

A new feature in the Museum is the addition of viewing boxes with large numbers of colour microphotographs in the various rooms. This is of particular value to the undergraduate students, but is also much appreciated by the many graduates who use the Museum.

A display of fresh gross material from the autopsy room, changed every week, has been viewed by very large numbers of students of both the junior and the senior years.



## RESEARCH

Dr. H. J. Barrie, in conjunction with Dr. A. J. Rhodes of the Connaught Laboratories, has been continuing his investigations on malignant granuloma of the nose. He has also been studying the anatomy and function of the intrinsic smooth muscle of the kidney and its relation to arteriovenous anastomoses at the arcuate line. Dr. G. W. Cates and Dr. Barrie have been investigating the effect of injections of adrenalin on the circulatory pattern of the kidney.

Other studies are those of Dr. A. Bogoch on the late lesions of sarcoidosis, the relation of sarcoidosis to cirrhosis, and multiple aneurisms of the iliac arteries; Dr. L. H. Campbell on abacterial pyuria; Dr. J. S. Crawford on organic lesions of the heart in dietary deficiencies; Dr. J. M. Finlay on amniotic fluid embolism of the lung following delivery; Dr. W. R. Harris on the role of intercellular substances in disease; Dr. W. K. Lindsay (with Dr. F. P. Dewar) on the relation of neuromata to metatarsalgia; Dr. I. D. Maxwell on sarcoma of the prostate; Dr. B. S. Wells on the pathology of muscle.

In the division of Bacteriology, in co-operation with the staff of the Toronto Hospital, Weston, a study on the value of p-aminosalicylic acid in the treatment of tuberculosis was continued. Bacteriological studies on an alternate series of cases treated with streptomycin alone and combined with PAS indicate that combined therapy markedly retards the emergence of tubercle bacilli resistant to streptomycin.

Dr. R. M. Price is continuing her interest in the prophylactic vaccination against tuberculosis. Last term about one hundred individuals were vaccinated with BCG supplied through the courtesy of Professor Armand Frappier, University of Montreal, and Professor Milton Brown, School of Hygiene. All those vaccinated became allergic, twenty-eight days later, to 1 mg. of old tuberculin.

The following investigations are in progress: Dr. G. H. Hawks, incidence of *Candida albicans* in bronchoscopic aspirations from the Toronto Hospital, Weston, torulosis of the brain (with Dr. S. J. Holmes); Dr. H. M. Ross, effect of cortisone on experimental infections, assay of Rh hapten; Dr. D. Black (Hermant Fellow in Ophthalmology), bacterial and viral infections of the external eye, nutritive value for bacteria of lens substance; Dr. H. N. Cleland, effect of hexachlorophene on the bacterial flora of the hands; in collaboration with the Department of Medicine, blood concentrations resulting from the use of various antibiotics, value of benemid in raising the blood concentration of penicillin, effect of terramycin on the gonococcus.

In the division of Neuropathology, Dr. Mary Tom has prepared a paper in conjunction with Dr. J. C. Richardson on "Hypoglycaemia from islet-cell tumour of the pancreas, with amyotrophy and cerebrospinal nerve cell changes." Dr. A. Bonkalo of Budapest has studied the effects of leukaemia on the central nervous system, Dr. C. L. Aszkanazy varices of the brain and spinal cord, and Dr. S. J. Holmes torulosis of the nervous system.

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## Pharmacology

*Under the direction of Professor J. K. W. Ferguson*

Courses were taught this year to the following: the third medical year; the second dental year; the second year, Ontario College of Pharmacy; graduate students (General Pharmacology); postgraduate students in Oto-Laryngology. Candidates for the degree of B.Sc.(Med.) were 3 in number. They all applied themselves to their duties and studies with commendable zeal.

We were happy to welcome a new lecturer in the person of Dr. W. Paul, a former student in the Department, who returned after a year of study at Cambridge University. Dr. Paul is a biophysicist with training in Pharmacology. He serves the faculty in another capacity, namely as supervisor of the new Clinical Radio Isotope Laboratory. It seems timely to remark that biophysicists are increasingly important members of any progressive faculty of medicine. Some thought must be given to the problem of providing permanent places in our organization for persons with this special training.

## RESEARCH

A new field of research has been entered this year with the installation of equipment to measure extremely small quantities of radon in exhaled or atmospheric air. Dr. Edgar J. Martin joined the Department in June, 1949 and after working six months at Chalk River to learn methods, he transported his delicate



equipment to Toronto and is now studying the effects of exposure in the radium industries.

Work on the pharmacology of substances affecting thyroid function has continued with the assistance of Dr. R. D. Prueter. Two very interesting substances, diiodothyronine and diiodohydroxybenzoic acid, are under study. The first suppresses thyrotropic action and the second antagonizes thyroxine.

Dr. Code Smith has continued his studies on cardiac irregularities under cyclopropane anaesthesia. He has found that the beneficial effect of procaine on these irregularities is due to an atropine-like action which is not shared by all local anaesthetics.

Studies on two local anaesthetics have been pursued intensively by Dr. E. J. Stark. Part of the study was done on animals in the Department of Pharmacology; the other part on patients, with the co-operation of the Department of Oto-Laryngology.

Dr. W. Paul, after a year's absence in England, has taken up again his development of the photoelectric oximeter. Under his direction Dr. John Hazlett has continued the work, now in its fourth year of using the oximeter during surgical operations on the chest in the Toronto General Hospital and other hospitals in the city. The instrument has proved its value as an indicator of the state of the patient during thoracic operations but expert help is still needed to run it and service it. Dr. Paul is making steady progress in improving the accuracy and reliability of the instrument.

#### *Under the direction of Professor G. H. W. Lucas*

Miss E. J. McCree has continued her investigation of tests for the identification of synthetic narcotic drugs related to pethidine. Two sensitive tests for bemidone have been developed. Mr. J. R. MacDougal has continued his researches on the identification of barbiturates and glycosides, employing colour and crystal tests. Some useful crystal tests for barbiturates have been developed. Mr. M. Misiak is investigating crude opium with the object of discovering some means of differentiating opium from different sources. These three studies were initiated at the request of the Dominion Government to help in the control of illicit traffic in drugs.

Dr. H. W. Smith has continued his studies on the toxicity of antabuse, a drug used in the treatment of chronic alcoholism. With the help of Mr. J. A. Long data are being collected on patients who have been treated with the help of antabuse for one year or longer. With the help of Mr. R. E. Popham, Dr. Smith is conducting a survey of traffic accidents, with a view to ascertaining by tests of alcohol content of the breath the contribution of alcohol to causation of accidents. In this work he is receiving the whole-hearted co-operation of the city and provincial police.

Dr. R. Smithurst has taken up a study left unfinished by Dr. R. J. S. Tickle on the alveolar oxygen tension, and blood oxygen content during nitrous oxide anaesthesia.

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## Physiology

*Under the direction of Professor C. H. Best*

The Physiological Society of the University of Toronto held twenty-two meetings in the 1949-50 session. Nine meetings were addressed by local investigators and thirteen papers were presented by visiting scientists: Dr. Edith Bülbring, Department of Pharmacology, University of Oxford; Dr. C. M. Fletcher, Medical Research Council, Great Britain; Dr. A. C. Frazer, Professor of Pharmacology, University of Birmingham; Dr. E. L. Harrington, Professor of Physics, and Dr. L. B. Jaques, Professor of Physiology, University of Saskatchewan; Dr. W. H. Johnston, Institute of Aviation Medicine, R.C.A.F.; Dr. E. P. Joslin, New England Deaconess Hospital, Boston, Mass.; Dr. F. C. MacIntosh, Professor of Physiology, McGill University; Dr. A. S. Parkes and Dr. G. Popjak, National Institute for Medical Research, London, England; Dr. K. Rodahl, Institute of Physiology, Oslo, Norway; Dr. G. W. Stavsky, Department of Physiology, University of Western Ontario; and Sir Henry Dale, President of the British Council.

### RESEARCH

Dr. R. E. Haist and his group have continued their investigations concerning factors affecting the growth of the islets of Langerhans, and have been studying also the influence of the pituitary, thyroid, adrenals, and gonads on secretin and the external secretion of the pancreas. Dr. M. A. Ashworth has been testing the effect of various dietary changes on islet growth. Mr. B. Kinash has been investigating the influence of the continuous, intra-arterial injection of glucose on islet volume and also the effects of pituitary growth hormone and of ACTH. Mrs. B. E. Hines and Dr. Ashworth have been following the changes in blood sugar level in rats continuously injected with glucose, and the effect of different, additional procedures on this level. The sustained blood sugar levels are being considered in relation to islet changes. Miss M. O. Maykut has continued a study of the effects of hypophysectomy on pancreas weight and on the amylase content of pancreas. She has been determining the influence of thyroid administration in hypophysectomized and in normal rats and is examining the effect of thyroidectomy on the amylase content of the pancreas. Mr. J. E. C. Dorchester has been investigating the influence of the pituitary, thyroid, and gonads on the secretin content of the intestine.

The work of the section of Biophysics under Professor D. Y. Solandt has been directed along two major lines. The use of a microwave beam for the exploration of cardiac septal potentials is under trial and an electronic radiator for this purpose has been built and tested. The investigation of olfactory phenomena, the second major field of investigation, has been carried forward by Dr. J. D. McQueen. Studies on the cerebral representation of olfaction, as indicated by cortical potentials produced by peripheral olfactory stimuli, have been initiated following the design and construction of special electronic apparatus.

Dr. E. A. Sellers has continued a study of the effects of cold and other stresses on intact animals. Dr. S. S. You, Dr. Rosemary Wen You, and Mr. N. W. Thomas have been associated in the investigation. Changes in nutritional requirements and in the adrenal and thyroid glands have been demonstrated. In the cold the usual response to the feeding of diets low in choline does not occur, as there is no excess deposition of liver fat. This interesting finding is being examined further in the hope that it may throw some light on the mechanism of action of choline. It has been



found that adrenalectomy usually prevents the loss of nitrogen from the body after injury. The role of steroids such as cortisone and desoxycorticosterone is being studied in this reaction. Dr. Sellers is continuing experiments on the production of adenomas of the thyroid by prolonged, continuous dosage of thiouracil.

A "hot" room has been constructed in the sub-basement of the Medical Building, in which a strong cobalt<sup>60</sup> source has been installed. This will be used to investigate the effects of gamma radiation on the endocrine system. Dr. Sellers, Mr. J. C. D. Barlow, and Mr. J. M. O. Wheatley are responsible for this project.

Studies on the role of the anterior pituitary gland in carbohydrate and fat metabolism have been continued by Dr. J. Campbell, Dr. H. P. Lei, and Mr. I. W. F. Davidson. Highly purified growth hormone and adrenocorticotrophic hormone (ACTH) were prepared from anterior pituitary glands and were tested biologically and by physico-chemical methods. Administration of the purified growth hormone to experimental animals, with established sensitivity, produced definite diabetes which became permanent on prolonged administration of the hormone. The diabetes is due to failure of insulin secretion by the pancreas, as indicated by the degeneration of the beta cells of the islets of Langerhans, by the very low insulin content of the pancreas, and by the nature of the diabetes. The ACTH produced signs of diabetes which were much less intense than those due to the growth hormone. Dr. Campbell is assisting the Connaught Laboratories programme for the production of ACTH.

Dr. J. Markowitz and his group are continuing their studies on dogs enabled by penicillin administration to survive total ligation of the hepatic artery. Dr. A. Rappaport is studying the effect on liver structure and function of curtailing the blood supply to the liver and is continuing his important work on the refashioning of the mitral valve, using the auricular appendage. Dr. W. M. Loughheed, Dr. Rappaport, and Mr. J. S. Munroe are investigating the effects of antibiotics on the survival of dogs after hepatectomy. A feature of this research has been the perfecting of a simple, dependable method for removing the liver in one operation. Dr. J. Archibald, a graduate student from the Ontario Veterinary College, Guelph, is making a study of the factors influencing the survival and function of the homo-transplanted kidney.

Dr. Loughheed is studying by a new approach the role of the pyloric section of the stomach in regulating gastric acidity.

Dr. E. Fidler has found that the platelet agglutinating property of commercial heparin appears to be a stable characteristic that is not significantly altered by storage. Neither has it been altered by addition to dog's blood and reisolation. Further investigation of this property is awaiting the production of heparin from canine material by Mr. F. C. Monkhouse.

Mr. Monkhouse has come to the Department from the University of Saskatchewan where he collaborated with Dr. L. B. Jaques in devising a new method for the determination of heparin. He is now working on a method of his own for the estimation of heparin in blood, which it is hoped may have a clinical application by giving a more accurate check on administration than the usual clotting-time tests. A recent case of Dr. R. L. MacMillan's at the Toronto General Hospital has given interesting results.

In collaboration with Dr. Sellers' group, a study of blood changes in irradiated animals has begun. Mr. Barlow, Mr. Monkhouse, and Dr. Fidler have examined rats which had received a dose of X-rays of 400 R. Although no significant change was found in coagulation time, a well-marked drop in the platelet count occurred 10 days after exposure. A decline in the leucocyte count also appeared, beginning within 24 hours and persisting at 72 hours. Counts at 24 days after exposure indicated that recovery was not yet complete.

Dr. E. S. Goranson and Mrs. N. M. Danoff have investigated changes in rat muscle phosphorylase activity produced by starvation, and by refeeding after an interval of starvation. The relative proportions of phosphorylase *a* and *b* are altered



in the 48-hour fasted rat with the active *a* form becoming more predominant. Carbohydrate refeeding after an interval of fasting has a marked effect in lowering the proportion of phosphorylase *a*. This is less pronounced on refeeding with an isocaloric fat diet. A reversal in phosphorylase activity towards that of fed controls was observed one hour after the simultaneous administration of glucose and insulin to fasted rats but not after the injection of insulin. Glucose alone, one hour after its injection into fasted rats, had a variable effect in reversing the activity of the enzyme.

Miss E. F. Purdie and Dr. Goranson have made a series of studies on muscle hexokinase activity in starved rats and in alloxan-diabetic rats, with insulin *in vitro*. In muscle preparations from 48-hour starved rats the hexokinase activity was lower than in those from fed animals, but this difference was not observed on aging the extracts or when the substrate concentration was elevated. Insulin *in vitro* produced no significant change in muscle hexokinase activity in alloxan-diabetic rats, or in fed or starved non-diabetic animals.

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## Psychiatry

*Under the direction of Professor Aldwyn Stokes*

Clinical teaching in Psychiatry is especially vulnerable to the demands of expedient urgent service. A psychiatric illness may or may not culminate in a fulminant episode; such an outcome is less frequent, yet when it occurs society presses for action. Society, and therefore governments, tend to limit the notion of psychiatric disability to the gross distortions of human behaviour, whereas the smouldering disturbances in aggregate constitute the major disability.

An oversimplification of approach by society is associated with an attitude to treatment. Short-term methods are demanded, failing which long-term custodial care is the alternative. Short-term methods are set up as representing techniques to



be learned; enough personnel to employ the learned techniques is the administrative goal. The implication is that there is little use for higher learning, for a patient careful survey of the wide ramifications of psychiatric disability, for a continuous long-term trial of new methods, for a constant stimulus to critical inquiry.

The disregard for higher learning, associated with an insistence on numbers of trained personnel, is more appropriate for a technical institute than a University clinical department. If such attitudes are held by a major source of funds the fostering of the University department is likely to be hedged around with restrictions, to be controlled minutely against any deviation from a production line. Restrictions and controls add a further administrative burden as a secondary load to a primary devitalization.

In this setting an account of the past year must of necessity include both advances and retrogressions in the activities of the Department of Psychiatry. An increase of funds under the Dominion and provincial Mental Health grants gave a potential of opportunity for an approach to the problems of psychiatric disorders. Part of the potential has been vitiated by the administrative conditions of the funds.

An allocation of \$124,550 was made by the provincial government to the Department of Psychiatry for the academic year. Authorization was delayed until June, 1949, and in the first instance covered the period to March, 1950. A further continuation budget was then authorized to complete the last three months. Despite the insecurity of tenure a number of senior appointments were filled with augmentation of the clinical teaching staff. Senior fellows, fellows, and postgraduate physicians, all directly or indirectly financed by the Mental Health grants for trainees, numbered 23. Of these 8 have or will have completed their four-year training to specialist status. In addition, postgraduate training in psychiatry for nurses, social workers, clinical psychologists, and occupational therapists has proceeded. Teachers have been given an experience in the mental health aspects of a school organization.

The Toronto Psychiatric Hospital itself has gravely limiting facilities, both in in-patient and out-patient work, for dealing with the wide sweep of psychiatric disorders. The University Department of Psychiatry has therefore continued in the policy of fostering other associations to broaden the field of experience for psychiatrists in training. Firm associations with the Wellesley Hospital, the Sunnybrook Hospital, the Hospital for Sick Children, and the Family Court have been developed. Clinical teachers have been appointed to each of these settings where the psychiatrists in training are assigned in rotation. Other associations are planned, as opportunity and funds allow, to make a worth-while educational centre in psychiatry.

Apart from the clinical associations, stronger ties are developing in the field of the basic sciences. Co-operation with the Banting Institute in the field of Biochemistry, with the Department of Pathology in respect to Neuropathology, and with the Department of Psychology and School of Social Work are illustrative of a concern for a rounded, broad educational experience.

Much remains to be done in the organizing of a first-class postgraduate education. Didactic methods are kept to a minimum: greater emphasis is put on a thoughtful approach to experience under supervision. The latter requires a senior staff equal in quality and quantity to the supervisory obligation. A senior staff of quality can develop only when professional status is fully allowed without the hazards of uncertain appointment.

Despite the imperfections, good young physicians are seeking training in increasing numbers with the objective of a life work in psychiatry.

In 1949 10 out of 11 candidates obtained the diploma in Psychiatry; 3 obtained the specialist certificate in Psychiatry of the Royal College. Dr. Randall MacLean of Ponoka, Alta., has been appointed external examiner.

Clinical instruction has been given to all four clinical years. The difficulties of direct experience with individual patients have not been overcome but some progress



has been made. For the first time the examination in psychiatry was conducted as a final-year test.

The academic Council has been active in its influence on the educational activities of the Department; a close working relationship with the University Mental Health Programme Committee has continued.

The University Health Service has used the facilities of the Department of Psychiatry in increasing measure. Winter discussions on mental health education were again carried out.

Additions to the library and laboratory facilities have been satisfactory.

Despite many imperfections in organization and administration an increasing number of physicians are benefiting from a broadening experience in the Department of Psychiatry. The immediate difficulty is to create conditions which will allow an unharassed senior staff to devote their work to the problems of breakdowns in living, and to contribute to a real advancement of psychiatric knowledge.

### RESEARCH

This year the chief research interest of the Department of Psychiatry has been biochemical. Dr. Rolf Gjessing and Dr. Leif Gjessing have followed some cases of periodic catatonic excitement by a kinetic methodology developed by them in Norway. One or two patients, investigated daily over many months, have shown important relationships between their metabolic functioning and mental state. The effect of ACTH on these relationships is being studied, in co-operation with Dr. A. G. Gornall of the Department of Pathological Chemistry. Dr. J. E. Goodwin has continued with his neurophysiological studies on alpha variants in cerebral electrical activity.

Psychometric research by Dr. M. R. King using a new projection technique has thrown light on the conforming or non-conforming relations of the individual to his cultural setting. Dr. D. S. MacDonald has completed a research on the personality associations of abnormal electrical activity of the cerebral cortex. Mr. B. Quarrington has started an investigation in group dynamics using a small group of selected patients, brought together for the purpose of discussing their personal problems. Mr. G. G. Elliott has continued to observe the performance of patients in block design construction with a view to isolating factors of significance for organic cerebral disease. Miss O. Griffith has interested herself in the effect of ward staff changes on the behaviour of patients in the ward.

A sociological inquiry into the emotional adjustment of school children has been continued by Mr. J. Seeley, assisted by Mr. R. A. Sim and Mr. T. J. Mallinson. Important determinants of bad mental health in the young are emerging. Mr. Farrell Toombs, of the Institute of Industrial Relations, is surveying the human and material organization of a psychiatric clinic with particular reference to interdisciplinary difficulties.

Apart from physical, psychological, and social researches of these sorts, items of clinical inquiry have been undertaken by the working staff. In particular an important follow-up study of patients submitted to leucotomy has been carried out in conjunction with the Neurosurgical division of the Department of Surgery.

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## Radiology

*Under the direction of Professor A. C. Singleton*

The Departments of Radiology in all five teaching hospitals within the University show an increase in volume and scope of radiological investigations and in therapeutic application of radiology, and a definite increase in the amount of clinical teaching.

In conjunction with the Department of University Extension a course for X-ray technicians has been set up, comprising instruction in two calendar years, the first of which is didactic, including instruction in Physics, English, and Psychology as well as in the construction of X-ray apparatus and the use of X-ray in diagnosis and therapy. Eighteen candidates have now completed the first year of their course. Radiological teaching has been conducted in all five of the University teaching hospitals.

The undergraduate teaching has been extended to include clinics in Radiology for the students in the final year during their term in Medicine; three hours a week have been added to the clinical teaching of Radiology. The clinics for the final-year group in Surgery have been continued.

An important development of the past year has been the changing of the diploma course from a one- to a two-year course, combined with internship during the two years, and the changing of the diploma from the Diploma of Radiology to the Diploma of Medical Radiology, in keeping with that of the English Colleges and of the English Conjoint Board. It is felt that a very definite improvement in the postgraduate teaching of Radiology will be accomplished by this change. The staff of the Department took part again in the teaching in the advanced postgraduate course in Medicine, Surgery, Obstetrics and Gynaecology, and in the refresher courses in Ophthalmology and Oto-Laryngology.

During the year Dr. C. L. Ash has spent some seven months in England and the Continent on a British Empire Cancer Campaign Exchange Fellowship, making his headquarters with Professor Windeyer at the Middlesex Hospital in London, but visiting the departments at the Holt Radium Institute in Manchester and the Royal Infirmary in Edinburgh, and also paying visits to Stockholm, Paris, and Zurich. Dr. Ash returned in April.

## RESEARCH

Research work in the Department of Radiology has been, as in other years, joint research with members of other departments.

Dr. C. L. Ash and Dr. Norman Delarue of the Department of Surgery have continued a study of the value of hormone therapy, particularly testosterone and oestrogen in late cases of carcinoma of the breast.



Dr. D. T. Burke has been continuing the investigation of radiographic density in planigraphy and has produced a colour film with sound, outlining and illustrating "The Radiological Investigation of the Cervical Spine." This film is to be shown at the Sixth International Congress of Radiology in London this coming summer.

Dr. O. B. Millar, in association with Dr. K. J. R. Wightman and Dr. O. H. Warwick of the Department of Medicine, has undertaken a study of the value of nitrogen mustard and some of its new derivatives in the treatment of lymphoblastomas and allied conditions.

Dr. John Munn has been conducting research into the appearance of the menstrual cycle in relationship to the appearance of secondary centres of ossification. Dr. Munn is continuing the investigation of pulmonary changes in pancreatic fibrosis.

Dr. M. V. Peters, in association with Dr. Anathalie Heath under the direction of Professor W. R. Franks, and with histological studies by Dr. W. S. Hartroft, has continued research into the influence of irradiation of the thymus gland on the incidence and course of leukaemia in a highly leukaemic strain of mice.

Dr. Peters, in association with Dr. Geraldine C. Maloney and Dr. Crawford B. Shier of the Department of Obstetrics and Gynaecology, has been investigating the value of cytological smear examinations as a possible indication of the response and prognosis of uterine tumours treated by radiotherapy.

In collaboration with Professor E. W. McHenry of the Department of Hygiene, Dr. Peters has undertaken a study of the effects of pyridoxine in X-radiation sickness.

In association with Dr. H. W. Wookey of the Department of Surgery, Dr. Peters has conducted a detailed survey of all the cases of carcinoma of the tongue and lip treated at the Ontario Institute of Radiotherapy from 1924 to 1944.

#### PUBLICATIONS

BURKE, D. T. "A stereoscopic viewing desk designed for limited space" (*Radiology*, vol. 54, no. 5, May, 1950, p. 750).

PETERS, M. V. "A study of survivals in Hodgkin's disease treated radiologically" (*American Journal of Roentgenology and Radium Therapy*, vol. 63, no. 3, March, 1950, p. 299).

### Surgery

*Under the direction of Professor R. M. Janes*

The programme of undergraduate training that has been outlined in recent reports has been continued with only minor modifications. The most important change has been the grouping of all third-year clinics in Surgery at the General Hospital on one morning a week for lecture-room demonstrations. It has been difficult to give students some contact with all aspects of the surgical specialties of which they should have at least a passing knowledge, particularly when special groups of cases have been segregated to facilitate treatment. It has been quite possible for a student to graduate without having seen many of these conditions. These special demonstrations illustrated with patients and lantern slides were well received by the students and will be continued.

The monthly rounds of the Head of the Department at St. Michael's Hospital and the Western Hospital have been continued. In addition to their primary function of unifying the Department, they have afforded a very pleasant opportunity this year to permit several distinguished visitors to see the work of the surgical staffs of several hospitals.

The organization which permits the Toronto General, St. Michael's, and Western Hospitals, the Hospital for Sick Children, Sunnybrook Hospital, and the Toronto Hospital for Tuberculosis to participate in a joint programme of resident training is very satisfactory. A committee composed of the surgeons-in-chief of these hospitals and the heads of all special divisions selects the trainees from the



list of applicants and assumes responsibility for rotating them in their appointments so that as far as is possible their wishes may be given consideration and each man may receive a balanced training in Surgery. The majority serve in more than one hospital. This tends to broaden their outlook and to emphasize the university character of the training. The assistance of the Toronto East General Hospital, the Hamilton General, and the Mountain Sanatorium is again acknowledged. The Department of Surgery is grateful for the participation of the basic departments in this training programme, particularly to Professor Boyd in the Department of Pathology, Professor Best in the Department of Physiology, Professor Grant in the Department of Anatomy, and Professor Dauphinee in the Department of Pathological Chemistry. Professor Farquharson has made it possible for each man to have six months in internal medicine without which no course of training is complete.

The following members of the course were granted a B.Sc.(Med.) degree this year in recognition of their work in the basic sciences: J. C. Callaghan, J. F. R. Fleming, J. W. Hazlett, and W. M. Loughheed. The following postgraduates were successful in passing the 1949 examination for Fellowship in the Royal College of Surgeons of Canada: D. M. Bean, J. W. Cluff, A. M. Crossland, J. R. Francis, D. L. MacIntosh, W. L. C. McGill, R. A. Mustard, W. E. Ortved, R. E. Pow, C. J. Robson, C. W. M. Service, and F. H. Wigmore. Only one thesis was received this year for the M.S. degree. As it was not regarded as meeting the requirements, the degree has not been awarded.

The advanced refresher course in Surgery was fully attended in September and October, 1949, and applications for the 1950 course exceed the number that can be admitted. A considerable integration of the courses in Medicine, Surgery, and Obstetrics and Gynaecology has avoided overlapping and waste of effort.

The clinical programmes arranged last year at the teaching hospitals and Sunnybrook on the afternoons of the regular meetings of the Surgical Section of the Academy of Medicine did not attract a sufficient number of surgeons from the surrounding distances to justify the efforts involved and will not be continued another year.

Dr. F. P. Dewar was one of five Canadians chosen to travel in England and Scotland as guests of the British Orthopaedic Association. This tour occupied three months and provided valuable experience and contacts. Dr. Ian Macdonald was in England six months on a travelling fellowship. While there he spent some time with Mr. Hermon Taylor studying gastroscopy. He has joined the surgical staff of the Toronto General Hospital and his knowledge of this special technique of investigation is proving of value. A Kellogg fellowship enabled Dr. Donald C. Robertson to devote six months to the study of plastic surgery in Chicago and San Francisco, and he is now in England on a travelling fellowship. On his return he will join the division of Plastic Surgery at the General Hospital. Dr. Charles Robson spent some time as a travelling fellow studying urology in the United States and has joined the division of Urology at the General Hospital. Dr. Charles Taylor is with Dr. W. H. Magoun in Chicago on a National Research Council fellowship doing research in neuroanatomy and neurophysiology. He will join the division of Neurosurgery at the General Hospital next year. Dr. Ray Heimbecker has held a National Research Council fellowship which has enabled him to be a year with Professor Alan Blalock at Johns Hopkins University doing cardiac research. He has returned to complete his surgical training.

Dr. W. G. Bigelow received the George Armstrong Peters Prize in Surgery for his work in relation to hypothermia. He has been elected to membership in the Society for Vascular Surgery and the Central Surgical Society. Dr. R. C. Harrison was awarded the Reeve Prize in Surgery. Dr. K. G. McKenzie has been President of the American Society of Neurological Surgeons.



The 1949 Donald Balfour Lecture was delivered on October 13 by Sir James Learmonth, Professor of Surgery, Edinburgh University, the subject being "Embolism and Thrombosis of the Aortic Bifurcation." The several days he spent as a guest of the Department were most stimulating and enjoyable. Sir Reginald Watson-Jones was a guest of the University from February 21 to 26, 1950, as the Commonwealth Professor of the Royal College of Surgeons of England for the year 1950. He was made a Visiting Professor in the Department of Surgery and in that capacity joined freely in the routine teaching activities of the Department. In addition he gave a lecture at Sunnybrook Hospital entitled "The Progress of a Half-Century in Fracture Treatment." This lecture was open to all doctors in the area. His visit was much appreciated.

The Head of the Department has had the privilege of serving as the Canadian representative on a committee of the American Surgical Association for the study of undergraduate surgical education. The report of this committee was presented to the annual meeting of the Association in Colorado Springs by the Chairman, Dr. Oliver Cope, and will be published in the *Annals of Surgery* in the near future. He was guest speaker at a post-graduate course in thoracic surgery in Los Angeles in February. During three weeks in Britain in April and May he delivered the Mitchell Lecture in Belfast on "Surgery and Pulmonary Tuberculosis" and the MacArthur Lecture in Edinburgh on "Lobectomy and Pneumonectomy for Pulmonary Tuberculosis," and participated in a symposium on thrombosis and the antithrombotics at the annual meeting of the Association of Surgeons of Great Britain and Ireland.

Dr. J. L. Russell has relinquished his appointment at the General Hospital to become head of the division of Urology at St. Michael's. Dr. Harold Wookey having reached the age of retirement has resigned from the position of Associate Professor of Surgery and Head of the Second Division of Surgery in the General Hospital. He has been appointed to the consulting staff and will continue his association with the Institute of Radiotherapy. Dr. Wookey has brought renown to the Department through his work on oral cancer and cancer of the oesophagus. As senior surgeon at the hospital he will be missed and his retirement is announced with regret. Dr. F. G. Kergin has assumed charge of the division and has been advanced to the rank of Associate Professor.

Publication of the volume of essays in honour of Professor W. E. Gallie has been unavoidably delayed but is now under way and these *Essays in Surgery* should be available in the near future.

The past year has been noteworthy because of the unusual number of distinguished visitors to the Department. Some of these have been: Mr. R. C. Brock, Guy's Hospital and Brompton Hospital, London; Mr. F. H. Bentley, Professor of Surgery, Newcastle-on-Tyne; Wing Commander L. M. Crooks, R.A.F.; Lt. Colonel J. M. Matheson, R.A.M.C., Medical Liaison Officer, British Joint Services Mission; Johan Holst, Professor of Surgery, Oslo, Norway; Viking Olov Björk, Docent, the Caroline Institute, Stockholm; Dr. Frederico E. Christmann, Professor Titular de Clinica Quirurgica, La Plata; Jorge de Moraes Grey, Professor of Surgery, Rio de Janeiro; Dr. Carlos H. Mayr, Rio de Janeiro. A large group of Swedish surgeons were also our guests. Visits from such distinguished representatives from other universities are enjoyable and in addition create valuable contacts for our staff.

#### RESEARCH

*Under the direction of Dr. W. G. Bigelow*

Dr. J. C. Callaghan has carried out experimental researches on hypothermia used as a means of reducing oxygen requirements of the body sufficiently to allow exclusion of the heart from circulation and permit intracardiac surgery. In collaboration with Mr. J. A. Hopps (an electrical engineer and member of the National



Research Council of Ottawa, on loan to the laboratory) and with the co-operation of the Division of Aviation Medical Research, R.C.A.F., he has evolved a radio-frequency method of rewarming animals at low body temperatures, and studies have been carried out on electrophrenic stimulation in hypothermic animals. He has been engaged in investigation of an electric artificial pace-maker for standstill of the heart, and of the influence of cortisone on blood sugar and survival of animals exposed to cold air and the immersion in cold water. In collaboration with the Department of Physiology studies have been made on blood sugar levels in conscious animals exposed to severe cold for prolonged periods. He has taken part in a joint study, with Dr. John Scott of the division of Neurosurgery, Dr. R. McQueen, and the Department of Physiology, on the effect of hypothermia upon the behaviour and electroencephalographic findings in Macchus monkey.

Studies have been made on acid base changes of the blood in hypothermia by Dr. J. F. R. Fleming, in collaboration with Professor J. A. Dauphinee and Mr. Clarence Downs of the Department of Pathological Chemistry. Dr. Fleming has also examined the effect of cortisone on burns, as well as the effect of cortisone on intravascular agglutination of erythrocytes (sludged blood) and sedimentation rate. In co-operation with the Department of Pathological Chemistry microscopic observations have been made of blood flowing through the cortex of living mammalian kidney, and of the effect of crush injury, shock and adrenalin on the cortical blood flow.

Dr. Bigelow has also directed certain clinical research. Dr. J. F. R. Fleming, in collaboration with Professor A. G. Gornall of the Department of Pathological Chemistry, has studied the management of surgical shock in the poor risk patient (the probable role of intravascular agglutination of erythrocytes and the production of reduced blood volume). Dr. O. V. Gray has investigated the etiology and treatment of postphlebitic ulcers and the relationship between lower extremity fractures and the postphlebitic state. Much of Dr. Bigelow's work has been aided by a grant from the Defence Research Board.

Other research in the Department has included a study of sensation and pain in paraplegia by Dr. E. H. Botterell, in collaboration with Dr. John Scott and Dr. A. T. Jousse.

Dr. R. I. Harris, aided by a National Research Council grant, has made a study of low back pain and sciatica and has carried out investigations on an improved type of tourniquet. Under his direction Dr. J. M. Lessard has reviewed the end results of treatment of fractures of the neck of the femur with special reference to the problems of avascular necrosis of the femoral head. Dr. P. O. Crassweller, aided by a grant from the Ontario Cancer Treatment and Research Foundation, has investigated the end results of treatment of malignant bone tumours.

Dr. G. H. C. Joynt has investigated the experimental production of bronchiectasis.

Dr. F. G. Kergin has made certain studies on the development and application of the oximeter, in association with the Department of Pharmacology. Under Dr. Kergin's direction Dr. J. W. Hazlett has investigated the healing of wounds of the bronchi.

Dr. I. B. Macdonald has carried out work on the transplantation of tissues and organs.

Dr. K. G. McKenzie has made a clinical investigation on the value of lobotomy and the proper selection of patients for this operation. This is being continued jointly by the division of Neurosurgery and the Department of Psychiatry.

Dr. R. A. Mustard has reviewed and followed up all cases of carcinoma of the thyroid treated at the Toronto General Hospital, and with Dr. MacAllister Johnston has investigated the use of radioactive iodine in the treatment of carcinoma of the thyroid and recurrent hyperthyroidism.



Dr. W. T. Mustard and Dr. A. L. Chute have made investigations on extra-corporeal circulation and a biological oxygenator.

Dr. H. F. Robertson has made plethysmographic studies of cases of peripheral vascular disease and assessed a new and simplified apparatus which might prove to be of practical value for use by clinicians. He has also made an investigation of coronary flow distal to an intraluminal block.

Dr. C. J. Robson has carried out an experimental study on the surgical correction of uretero-pelvic junction strictures of the kidney.

Dr. J. L. Russell has done certain investigation of pyeloplasty for stricture of the uretero-pelvic junction without the use of splinting or drainage.

Dr. E. B. Tovee has directed Dr. W. B. McClintock in an investigation of closed loop obstructions and studies on aseptic necrosis of the head of the femur.

#### PUBLICATIONS

ABERHART, CARL "Abacterial pyuria, acute and chronic: Its progress and treatment" (*Journal of Urology*, vol. 63, May, 1949, pp. 903-11).

DEWAR, F. P. "Forefeet and faulty footwear" (*University of Toronto Medical Journal*, vol. 27, no. 5, Feb., 1950, pp. 189-93).

GORDON, S. D. "Fractures of the malar—a method of maintaining position in cases in which reduction is delayed" (*British Journal of Plastic Surgery*, vol. 11, no. 2, July, 1949, pp. 134-5).

HARRIS, R. I. "Osteological evidence of disease amongst the Huron Indians" (*University of Toronto Medical Journal*, vol. 27, no. 2, Nov., 1949, pp. 71-5).

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JANES, R. M. "The management of carcinoma of the breast" (*Canadian Medical Association Journal*, vol. 62, Jan., 1950, pp. 14-19).

KERGIN, F. G. "The surgical treatment of bilateral bronchiectasis" (*Journal of Thoracic Surgery*, vol. 19, no. 2, Feb., 1950, pp. 257-69).

LEWIS, F. I. "Diverticulitis of the colon" (*Annals of Surgery*, Nov., 1949).

SPOONER, C. M. "Investigation of fertility in the male" (*Proceedings of the Academy of Medicine, Toronto*, vol. 22, no. 2, Sept., 1949, pp. 244-50).

### Therapeutics

*Under the direction of Professor R. B. Kerr*

The teaching of Therapeutics has been carried out in the same general manner as in previous years. Special attention is given to the principles of therapy as well as to the details of therapeutic methods. The importance of consideration of all aspects of the effect of illness upon the individual is stressed and opportunity is given to the students to study the problem of treatment of an individual patient suffering from an illness by the presentation of cases and the writing of exercises in the treatment of the cases by the students.

Dr. George A. Low has held the research fellowship in Therapeutics for the session. Dr. D. M. Finlayson, Dr. J. A. Little, and Dr. W. B. Spaulding were appointed as Assistants in Therapeutics for the session.

#### RESEARCH

Dr. George Low with Dr. R. B. Kerr has continued the investigation of changes in electrolytes particularly potassium and phosphate in cases of diabetic acidosis under treatment. Detailed study of a case of anuria due to carbon tetrachloride was carried out in which a method of intestinal perfusion with sodium sulphate solution was used; a marked lowering of the serum potassium from high levels to normal limits accompanied the application of this method. An interesting case of Cushing's syndrome was studied in detail in which marked improvement followed treatment with testosterone. This work has been done with the kind co-operation of Professor Dauphinee of the Department of Pathological Chemistry.



Continued study is being made of cases of diabetes mellitus which began in childhood, with special reference to the occurrence of degenerative lesions in long-standing cases. This is a co-operative study with the Department of Medicine and Dr. A. L. Chute of the Department of Paediatrics.

#### PUBLICATIONS

GORDON, R. A. "Anaesthetic disasters" (*Modern Medicine of Canada*, vol. 5, March, 1950, pp. 19-22).

———"Application of intravenous procaine therapy to traumatic surgery" (*Current Researches in Anesthesia and Analgesia*, vol. 29, Jan.-Feb., 1950, pp. 54-6).

HARGRAVES, R. "Anaesthesia for thoracic surgery" (*Bulletin of the Academy of Medicine, Toronto*, vol. 23, Dec., 1949, pp. 45-51).

KERR, R. B. "The clinical importance of changes in potassium metabolism in diabetic acidosis" (*Proceedings of the Royal College of Physicians and Surgeons of Canada*, 1949).

SHIELDS, H. J. "Samuel Johnston: His life: His contribution to Canadian anesthesia" (*Current Researches in Anesthesia and Analgesia*, vol. 28, Nov.-Dec., 1949, pp. 301-6).

### *Banting and Best Department of Medical Research*

*Reported by Professor C. H. Best*

Professor C. C. Lucas, Drs. Jessie H. Ridout and Jean M. Patterson, and the Director of the Department have made a study of the time relationships involved in the lipotropic action of choline, inositol, and the two together in rats given a high vitamin diet following a period of vitamin depletion. The results reveal certain errors in technique and interpretation of some work published by others in this field. Dr. Lucas has established the organic sulphur requirement of weanling male rats of the Wistar strain and the minimal amount of methionine required to give maximal rate of gain in weight. A fraction was isolated from beef spinal cord from which cerebrosides and sphingomyelin are being separated for further study.

Dr. Lucas and Dr. Patterson are testing a new mineral mixture proposed for use in synthetic diets. It contains all the trace elements believed necessary for mammals and is made from salts which are available commercially in finely powdered form, thus avoiding grinding operations and greatly simplifying the preparation of large amounts of the mineral mixture.

Dr. Lucas and Dr. Ridout have made further studies of methods for lipid estimations in tissues. Dr. Ridout has devoted much time to the careful supervision of a long-term study of dietary cirrhosis in white rats which is being conducted in this Department.

Professor Gerald Wrenshall and Miss B. A. Karger have been studying the condensate from normal and diabetic human breath, by means of the mass spectrograph, to determine the acetone content. Dr. Wrenshall has conducted a very full programme of work on the insulin content of the pancreas of diabetic and non-diabetic human subjects and of dog pancreas after alloxan.

In the section of Histopathology, under Professor W. Stanley Hartroft, over 12,000 micro-sections have been prepared, many by special techniques, for the members of this Department and for those of the Department of Physiology. Dr. Hartroft has continued studies of hypertension in the rat of dietary (choline deficiency) origin. He has extended his investigation of the pathogenesis of dietary cirrhosis in rats and reported that the fatty cysts (lipodiastaemata) which form in the livers of these animals frequently rupture into both the biliary and the vascular systems. Dr. Hartroft is also completing a cytological survey of the islets of Langerhans in patients dying from both diabetic and non-diabetic conditions.

Dr. A. R. Colwell, Jr., working in Dr. Hartroft's section, completed his studies of the role of bile in the intestinal absorption of fat. He found that the percentage of fat excreted in the bile of choline-deficient rats is not increased when the liver is fatty.



Mr. R. R. Tasker, working in the section of Histopathology, has developed the technique for collecting lymph from the abdominal lymphatic trunk of the rat. He plans a series of investigations utilizing this method.

Dr. W. G. B. Casselman has studied various histochemical methods for the identification of lipids in micro-sections. He is also conducting experiments concerning hypertension in rats following choline deficiency and other conditions.

Miss P. J. Merritt, working with Dr. Hartroft, has investigated the relation of a deficiency of the heat-stable fraction of the vitamin B complex to dietary hypertension. Using Wistar rats, she has found that only a deficiency of choline is important in this regard. Miss Merritt also assisted Dr. Hartroft in the completion of a series of experiments which demonstrated the necessity of dietary choline for the reproduction of rats.

Professor L. B. Macpherson has begun an investigation into the nature and action of the pancreatic anti-fatty liver factor. Crystalline trypsin and chymotrypsin have been isolated from the crude factor. Experiments designed to test the hypothesis that it is this enzymic nature of the pancreatic factor which is responsible for its anti-fatty liver activity are being carried on in collaboration with Dr. G. H. A. Clowes, Jr. A pancreatic duct-ligated rat preparation devised by Dr. Clowes is being used as the experimental animal. The proteolytic activity in the duodenal contents of such an animal has now been shown to be very low or absent. The findings of Dr. Macpherson and Miss Eleanor Eldridge in their investigation of the soy bean phosphoinositide have indicated divergence from the original work on soy bean lipositol. Dr. Macpherson has improved the method for the isolation of crystalline lysozyme and with Dr. Lucas has devised a simpler and more accurate method for the lipid analysis of bile.

Dr. Clowes has evolved a technique for the ligation of the pancreatic ducts in rats which is now standardized and produces acinar atrophy in 80 per cent of operations. He has also been able to produce diabetes in rats by surgical removal of the pancreas.

An operation for approaching the mitral valve through the wall of the left ventricle is being developed by Dr. Clowes and Dr. J. Hunter. It depends upon sidetracking the circulation from the left ventricle by pumping blood from the confluence of the pulmonary veins into the systemic arterial system. This and other problems, such as a study of ulcerative colitis, may be considered joint efforts with the Department of Surgery as Dr. Clowes holds an appointment also under Professor R. M. Janes.

In February, 1949, Professor J. Markowitz, Dr. A. Rappaport and Dr. J. W. Scott of the Department of Physiology, University of Toronto, reported that, although ligation of the hepatic artery of dogs almost always resulted in their death, the administration of large doses of penicillin for ten days postoperatively usually prevented such an outcome. During the past year Dr. Colwell, Dr. D. Fraser, Jr., Dr. Rappaport, and Dr. C. Vuylsteke have confirmed this report and have extended the work. The improved rate of survival as a result of the use of antibiotics indicates that bacteria play an important role in producing death of animals, but it has been shown that despite the combined use of penicillin, streptomycin, chloromycetin, sulphamerazine, and gas gangrene antitoxin, lethal liver damage may still occur after hepatic artery ligation. In the latter animals there is good evidence that bacteria were not a factor in causing liver damage or death.

Mr. G. Balasubramanyam and Dr. Fraser have studied the action of a "native" insulin obtained by pilot scale trials of a modified method for the preparation of insulin. A preliminary study of the chemical nature of the "native" insulin seems to indicate that it might be an insulin-protein complex. The preparation appears to have a constant chemical composition as shown by constant values for total protein nitrogen per unit of insulin. These values, and a potency of the zinc-free, dry preparation of nearly four insulin units per mg., indicate that the preparation is



impure when compared with crystalline insulin. The "native" insulin has a prompt action and also one which persists for prolonged periods.

Factors influencing the development of aortic atherosclerosis have been investigated in rabbits fed cholesterol by Dr. J. B. Firstbrook. The extent of lesions has been found to be proportional to the average blood cholesterol level, the initial body weight, the rate of weight gain, and the duration of cholesterol administration. There is a high correlation between the extent of lesions and average blood cholesterol level when other factors are constant, but caloric restriction markedly inhibits the development of lesions even in animals with high blood cholesterol levels. Choline fed in capsule form has been found to have no effect on the development of atherosclerosis.

Dr. W. J. Linghorne and Mr. D. C. O'Connell are continuing their dental research. Under experimental conditions both reattachment of the soft tissues and restoration of lost alveolar bone have been effected. Studies for the purpose of obtaining further knowledge of the principles concerned in these reparative processes are being continued. Studies of fuso-spirochetal infection in relation to periodontal disease are also under way.

The following work is being carried out under the direction of Professor W. R. Franks. The biological effect of radiation has been studied with the assistance of Mr. G. A. Meek. This project includes investigations of the influence of background radiation on carcinogenesis and the modification of the causative agent of Rous sarcoma by radiation of specific wave-lengths with a view to producing *in vitro* the change in the agent which has been shown to result in an immune response *in vivo*. A reduction in the background radiation to 0.2 ions per cc. per second has been shown not to influence the carcinogenic activity of methylcholanthrene in mice.

With Mr. R. Bather and Mr. A. Rodgman an inhibition of chemical carcinogenesis has been shown by hormones known to play a part in normal metamorphosis (pupating hormone which contains bromine and thyroxine). Conversely, the carcinogen dibenzanthracene has shown a seasonal antagonistic action to thyroxine. Thyroxine seems to inhibit the growth but not the infectivity of Rous sarcoma when administered with the agent. A carbamido conjugation between thyroxine and dibenzanthracene has been shown to be non-carcinogenic yet gives evidence of retaining the thyroxine activity on tumour inhibition.

The work on the isolation and modification of a causative agent in various tumours has been carried out with the assistance of Miss J. Manser and Mr. M. Sutton. With Miss Manser it has been shown that a more infective extract can be prepared from Rous sarcoma by extracting with potassium solutions which are similar to intracellular rather than intercellular cation content. The use of similar extracts of mammalian tumour has failed to produce any cell-free agent to date.

The use of kinetic jet injection of tumour cell fractions into normal cells in various stages of mitotic or metabolic activity has been commenced. To date, birds injected by this technique have eventually grown tumours that have regressed and thereby conferred an immunity. This work is being extended.

The use of chemically conjugated carcinogens with proteins has indicated that any immunity conferred with these solutions is of secondary order.

In the sub-department of Cellular Physiology work on the following research projects has been carried out under the direction of Professor B. Mendel. Dr. Mendel and Mr. D. Myers have continued their investigation of the characteristics of the common esterases present in tumour cells and the susceptibility of these enzymes to various inhibitors. Mr. Myers has also been engaged in experiments designed to elucidate the characteristics of the complex formed between the cholinesterases and their irreversible and reversible inhibitors.

Professor Rosemary Hawkins and Miss M. Nishikawara have investigated the mechanism whereby the ingestion of hypolipotropic diets induces a highly significant



elevation in the level of plasma pseudo-cholinesterase. Weanling rats as well as adult rats exhibit this phenomenon, and its prevention can be effected by the addition of choline, methionine, betaine, or triethylcholine to the diet. The ingestion of a hypolipotropic diet by thyroidectomized rats fails to produce an elevation of the plasma pseudo-cholinesterase beyond that due to thyroidectomy itself. Dr. Hawkins, Dr. Hunter, and Miss Nishikawara have also studied the effect of various factors on the level of pseudo-cholinesterase in the intestinal mucosa of the rat.

The investigation of the amino acid composition of liver proteins of hepatoma-bearing rats has been continued by Dr. P. L. Hoogland, Miss Lang, and Mrs. J. Gillespie. This work was undertaken to study the possible changes in the composition of proteins of liver cells during transition from normalcy to malignancy induced by feeding p-dimethyl-aminoazobenzene.

In the sub-department of Synthetic Chemistry, under the direction of Professor Erich Baer, the following research work was carried out. Miss M. E. Russell and Mr. J. Maurukas continued in their endeavours to synthesize  $\alpha$ -cephalins. Both the L- $\alpha$ -distearoyl and L- $\alpha$ -dipalmitoyl cephalin were obtained in configuration and constitutional purity. The synthesis was improved in several respects. Mr. A. G. Newcombe is developing a general procedure which ultimately should permit the synthesis of either saturated or unsaturated  $\alpha$ -lecithins and  $\alpha$ -cephalins. Three saturated L- $\alpha$ -phosphatidic acids were synthesized and their choline and ethanolamine salts were prepared. Co-operative studies with several independent serological laboratories are being undertaken regarding the value of the synthetic L- $\alpha$ -lecithins as one of the two components of the antigens used in the serological tests for syphilis. The synthesis of the second component of the antigen, i.e., that of cardiolipin or of closely related substances, is being undertaken. It is hoped that these experiments will lead to a fully synthetic antigen. The synthesis of a newly discovered catalyst in carbohydrate metabolism, namely, that of 2,3-diphosphoryl D-glyceric acid has been accomplished.

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- "The President's address" (*Proceedings of the American Diabetes Association*, vol. 9, 1949, pp. 11-14).
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